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NUCLEAR REGULATORY COMMISSION

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WORKSHOP ON SPENT FUEL STORAGE

CASK TESTING PROTOCOLS

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WEDNESDAY

MARCH 12, 2003

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LAS VEGAS, NEVADA

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The Public Meeting was called to order at the Conference Room of the Clark County Building Department, 4701 West Russell Road, Las Vegas, Nevada, at 10:05 a.m., by F.X. "Chip" Cameron, Facilitator, presiding.

PARTICIPANTS:

MIKE BAUGHMAN, Lincoln County, Nevada

BONNIE BOBB, Yomba Shoshone

RICK BOYLE, U.S. Department of Transportation

CHRISTOPHER BAJWA, NRC

E. WILLIAM BRACH, NRC

JIM CHANNELL, State of New Mexico

MIKE CONROY, U.S. Department of Energy

TOM DANNER, NAC International

PARTICIPANTS: (CONT.)

FRED DILGER, Clark County, Nevada, NRD

ROBERT HALSTEAD, State of Nevada, ANP

CASE JASZCZAK, Nye County

PEGGY MAZE JOHNSON, Citizen Alert

JOHN KESSLER, EPRI

JOSIE LARSEN, White Pine County, Nevada

CINDY MARQUES, Ely Shoshone Tribe

CALVIN MEYERS, Moapa Paiute Tribe

ANDREW MURPHY, NRC

DIANNE NIELSON, State of Utah

JIM PEGUES, City of Las Vegas, Nevada

AMY SNYDER, NRC

KEN SORENSON, Sandia National Laboratories

KALYNDA TILGES, Shundahai Network

JUDY TREICHEL, Nevada Nuclear Waste Task Force

JOHN WELLS, Western Shoshone National Council

DAVE ZABRANSKY, U.S. Department of Energy

A-G-E-N-D-A

P-R-O-C-E-E-D-I-N-G-S

(10:05 a.m.)

FACILITATOR CAMERON: Good morning. My name is Chip Cameron, and I am the Special Counsel for Public Liaison at the Nuclear Regulatory Commission, the NRC, and I would like to welcome you to the NRC public meeting this morning.

And our topic for today is the NRC's plans to conduct full-scale testing of spent fuel transportation casks, and that plan is embodied in this report that all of you should have, the Package Performance Study Test Protocols.

And it is my pleasure to serve as your Facilitator for the meeting today, and my general responsibility in that role will be to try to help all of you have a productive meeting.

Before we get into the substance of today's discussions, I just wanted to talk a little bit about meeting process issues -- the purpose of the meeting, the format and ground rules -- and go through the agenda for you so you know what to expect today.

In terms of why we are here, the first purpose is to clearly explain the NRC plans to do full-scale testing; why are we doing this, what is planned, and how are we going to try to accomplish it.

The second purpose and the most important purpose is to listen to your views and recommendations on these plans. The ultimate goal is to use the discussion today, and any written comments that we get, any comments from other types of public meetings on this issue, and to use those comments to assist us in finalizing the test protocol.

In terms of the format for the meeting, we are in what we all a roundtable format, and obviously not literally round, but we have a broad spectrum of affected interests, commonly called stakeholders around the table, and people whose organizations are affected, and concerned, and knowledgeable about these transportation issues.

And the purpose of doing a roundtable format like this is that we are fundamentally interested in each person's views on these issues, but in a roundtable we want to try to engage all of you in a discussion of those individual views by others around the table.

And we hope that this will give us another perspective, another type of information that we won't get just by reading the individual comments, or just by hearing individual oral comments that are presented at the meetings.

And this leads me to the ground rules. The first one is to try to be focused and concise in your comments today. The roundtable gives us an opportunity to develop a richness of views on these views, but it means that we have to sacrifice going into a lot of detail on your individual comments.

And we want to make sure that everybody around the table has an opportunity to express their views and we want to cover all the items on the agenda, and hopefully get us out of here at a reasonable hour at the end of the day.

So I would just ask you to try to keep your comments to major points. I know that that can be difficult on these controversial issues, but let's see how we can do with that.

If you have a recommendation, please try to give us the rationale behind that recommendation. You have name tags in front of you, and if you want to talk, please put this up on the end, and that will cue me into the fact that you do have something to say, and will relieve you of the burden of having your hand up all the time.

Because we want to get the reaction of others around the table to your views, I may not take the cards in the order that they come up so that we can follow what I call discussion threads, and please only speak one at a time, because we are having a transcript taken.

Our stenographer is right over there, and that transcript will be available before the written comment period closes, and so you will have an opportunity to look at that.

Now, because we want to try to get a discussion of views, we are in the roundtable format, and the focus is up here, but we know that this is an important issue obviously to all of you who are in the audience.

And so at several times during the meeting I will go on to you to see if you have any comments or questions. So we will be out to you for your views.

In terms of the agenda for today's meeting, we are going to give you some background first, some relatively brief presentations by the Nuclear Regulatory Commission and our expert consultants, on what are the NRC responsibilities generally for these types of issues, and what is our mission, and why are we doing full-scale cask testing, and some details of what we plan to do.

And I will be introducing the speakers in a minute, and we will go to you for questions about those presentations to make sure that we have as much clarity on this before we go into the discussion.

The next item on the agenda is called participant interests, and this is basically just a short statement of your major interests and concerns on this issue. It will provide a foundation for our discussions through the rest of the day, and it will also help us do some agenda building to make sure that we are covering all of the items of importance to you.

And again try to keep it to 2 minutes, or 3 minutes. I know that can seem like an incredibly short period of time. I know that some people will go beyond 2 or 3 minutes, and some people less. But try to keep it short, and there will be plenty of opportunities throughout the day for everybody to talk on the issues.

The first major discussion piece is called overarching issues, and basically we want to take a look at what are the objectives for doing this full-scale testing. There is a number of them stated; public confidence, realism, confirmatory.

We want to talk about and hear your views on those objectives, and how you define them, for example, and what does public confidence mean. How do you build public confidence in terms of a program like this.

What are the relationships among the objectives in terms of full-scale testing. Do you have to do different types of testing to gain public confidence, whatever that is, and then what you would need to confirm the NRC's models that are used in licensing.

And this is also going to be the time I think to talk about advantages and disadvantages of full-scale testing, and some of you are going to have proposals on how to do it differently than what the NRC has proposed.

And we are here to listen to that and to consider that before we go on to develop a final plan. We will finally get to lunch, and that is an hour-and-a-half, and so I think that should give you plenty of time for lunch.

And then we are back to look at a couple of general testing issues, types and numbers of casks, for example; and that should be pretty short. We then go to the discussion of the aspects of the test protocol on fire testing.

And for each of these discussion areas, we are going to have a member of the NRC staff do what I call tee the issue up, so that you understand what the major issues of concern to us are there, and Amy Snyder, who is here, and who will introduce herself in a minute, is going to tee that up for us.

We do have some -- we know that there is a lot of interest in something called the Baltimore Tunnel fire, and we do have some data on that and we are going to have Mr. Chris Bajwa from the NRC staff, a thermal engineer, tell us what the NRC has looked at there.

And also besides, I know that there are probably other people that have expertise on that, but Fred Dilger and Bob Halstead up at the table, who have just done a paper on that, and we can probably make available.

Okay. After fire testing, we take a break, and then we are going to come back to impact testing, and discuss that, and then see if there is any other issues.

And there may be process issues of concern, and I think we probably should discuss that during the overarching issues, and by process issues, I mean what types of public input, further public involvement should there be as the NRC develops these test protocols and actually implements them.

And I think that people will have ideas on that. I would just thank all of you for taking the time to be here today and let's just go around the table quickly and introduce ourselves.

You will get a chance to tell us about your interests and concerns later this morning, but let's just find out who everybody is, and then I will introduce Bill Brach, and we will go to the first presentation. Amy, do you want to start?

MS. SNYDER: Good morning, everyone. I am Amy Snyder, and I am the project manager for the spent fuel project office, the NRC spent fuel project office, and I am glad that you could come here to listen to your comments, and ideas, and consider them. Thank you.

MR. DANNER: Good morning. My name is Tom Danner, and I am with the NAC International, a cask supplier to our industry. I represent the engineering and licensing part of the business, and hope to be able to be a compliment to the program.

MR. BOYLE: Good morning. I am Rick Boyle, and I work with the U.S. Department of Transportation in their hazardous material safety office, and I head up their radioactive material transport branch. Thank you.

MR. HALSTEAD: I am Bob Halstead, a

Transportation Advisor to the State of Nevada's Agency for Nuclear Projects.

MR. DILGER: I am Fred Dilger with Clark County, Nevada, and I am the transportation advisor for Clark County, Nevada, as it relates to nuclear waste shipments.

MS. JOHNSON: Good morning. I am Peggy Maze Johnson, and I am the executive director of Citizen Alert. We are an organization that has been in Nevada for 27 years fighting the transportation of nuclear waste to our State.

MS. TREICHEL: Judy Trichel, Nevada Nuclear Waste Task Force. Thank you.

MR. KESSLER: John Kessler, manager of EPRI's spent fuel and high level waste disposal program.

MR. SORENSON: Good morning, Ken Sorenson, Sandia National Laboratories. We are the technical support organization for the NRC on this program.

DR. MURPHY: I am Andy Murphy, with the NRC research office, and I am the project manager for the package performance study.

MR. BRACH: Good morning. I am Bill Brach, and I am the director of the NRC's spent fuel project office.

MS. TILGES: Good morning, Kalynda Tilges, executive director, Shundahai Network.

MR. PEGUES: Good morning. I am Jim Pegues representing the City of Las Vegas, and I would like to welcome everyone from out of town.

MR. WELLS: Good morning. I am John Wells, and I am the Southern Representative to the Western Shoshone National Council, which is the traditional government of the Western Shoshone Nation.

DR. BOBB: Good morning. My name is Dr. Bonnie Everhart Bobb, and I am the director of the Office of Environmental Protection of the Yomba Shoshone Tribe, which is under the Shoshone Nation.

MR. MEYERS: I cam Calvin Meyers, from the Moapa Paiutes and I am the Environmental Coordinator for the tribe.

MS. MARQUES: Hi, I am Cindy Marques, and I am Western Shoshone, and I work for the Ely Shoshone Tribe as an environmental specialist.

MR. ZABRANSKY: I am David Zabransky from DOE's Radioactive Waste Management Program.

MR. CONROY: Good morning. I am Michael Conroy from the U.S. Department of Energy, Office of Environmental Management, Office of Transportation.

MS. LARSEN: I am Josie Larsen, Director

of White Pine County's Nuclear Waste Project Office.

MR. BAUGHMAN: Mike Baughman, Lincoln County, Intertech Services, and designated by the Secretary of Energy and host of one of the sites identified by DOE for rail and truck transportation of radioactive waste.

MR. CHANNELL: Jim Channell, Deputy Director of the New Mexico Environmental Evaluation Group. I have been involved in all kinds of transportation waste shipment issues for over 20 years.

MR. JSASCZAK: I am Cash Jsasczak, and I am here substituting for Mal Murphy, who normally would represent the Nye County Natural Resources and Federal Facilities Office.

MS. NIELSON: I am Diane Nielson, and I am the executive director of the Utah Department of Environmental Quality and the State's contact on the present fuel storage proposal.

FACILITATOR CAMERON: Okay. Thank you, and thank you, Diane. I thank all of you. You can see that we have an impressive group of people around the table today, and I just wanted to add one thing in terms of John Kessler.

EPRI is the Electric Power Research Institute, and I don't know who is more actively involved in this testing program than other places, but I know that there is a lot, and so we will try to make sure that we tell people what those acronyms mean as we go along today.

And let me introduce Bill Brach. He already told you that he is the Director of the Spent Fuel Project Office, and that is the key organization within the Nuclear Regulatory Commission that handles the regulatory aspects of spent fuel transportation and other issues.

And Bill has been with the NRC and the Atomic Energy Commission, the AEC, the predecessor to the NRC, for 30 years. And he originally started out back at -- I was going to say the turn of the century, but it was 1971, as an inspector in the AEC's Oak Ridge, Tennessee, field office.

He has been involved in almost every aspect of NRC regulatory activities. Safeguards, licensing issues, vendor inspections, reactor licensing, performance evaluation, low level waste and decommissioning, and the medical and industrial use of nuclear materials.

So he has managed all aspects of these programs, and since 1999, he has been the Director of the Spent Fuel Project Office, and I will turn it over to Bill at this point.

MR. BRACH: Good morning everyone. I didn't feel old until I listened to Chip, and with his turn of the century comment, I am not quite that dated. But again good morning, and on behalf of the NRC, I want to welcome all of you to today's roundtable discussion, and our workshop on spent fuel transportation package performance study.

As Chip mentioned, I am the Director of the Spent Fuel Project Office, and our office licenses and inspects interim storage facilities for spent nuclear fuel, as well as the certification of transportation of radioactive material, including the transportation of spent fuel.

The NRC's principal and guiding mission is protecting public health and safety, common defense and security, and the environment. The NRC's primary role in transportation of spent fuel to a repository would be certification of packages used for transportation.

I believe the NRC is well positioned to maintain its independent focus on maintaining safety in this important activity. The NRC staff believes that shipments of spent fuel in the U.S. are safe using the current regulations and programs.

I believe that is an important point, and let me repeat that, because I think it is important to be sure that we have that as a backdrop if you will for our discussions later today on the package performance study.

We on the NRC staff believe that the shipments of spent fuel in the U.S. are safe using the current regulations and current programs. This belief is based on NRC's confidence in the robustness of the shipping containers that we certify, and the ongoing research in transportation safety.

And also as noted in the third bullet in the overhead, this confidence is based on industry's compliance with safety regulations and the conditions of certificates that has resulted in an outstanding transportation safety record.

We have been studying the issue of transportation safety for more than 25 years, and we continually find that the likelihood of release from an accident and the associated risks to the public are extremely low.

Even so the NRC continues to be vigilant about transportation safety as an essential part of our mission. The NRC follows an aggressive program to investigate and assess the continued safety of spent fuel shipments, including analyzing spent fuel transportation experience, and records, to better understand safety issues.

Evaluating new transportation issues, such as the potential for increased shipment levels, increased and changing cask contents, populations among the routes, and other factors, as well as using new technology, such as enhanced modeling and analysis tools to estimate the current and future levels of potential risks to the public.

The package performance study, or the PPS, and I apologize, as Chip has mentioned, we use a lot of acronyms, but PPS is one that we will be using quite prevalently today, and that is the package performance study, an important part of the NRC's confirmatory research program for spent fuel transport.

The Office of Nuclear Regulatory Research has the NRC lead for the study, with assistance from our office, the Spent Fuel Project Office, for problematic direction, as well as public outreach activities.

I want to be clear that we recognize that some stakeholders do not share the NRC's confidence in its regulatory programs. We believe that the package performance study can be appropriately used for others to understand, and I will add to hopefully gain and share in our confidence.

I want to provide now just a very brief overview of the package performance study from its inception, leading up to our meeting today. The package performance study began with a series of public meetings to collect views on possible future work and shipments of spent fuel, and to identify possible follow-on work through a new regulatory report, CR 6672 that we issued in March of 2000.

In 1999, we had our first series of public meetings. After the first set of these four public package performance study meetings, the NRC published what we call the issues report in June of 2000.

Now, this report compiled stakeholders input obtained from the four public meetings held in 1999, and from letters and e-mail comments that we received.

The comments from the stakeholders on the issues report included nuclear industry groups, transportation industry groups, the Departments of Energy, the Department of Transportation, the State, local and tribal governments, public interest groups, and members of the public.

I will note as well that many of the people at our roundtable discussion today were participants in these meetings in 1999 and their comments were reflected and considered as we are moving forward in this study.

Now, to discuss whether the issues reports accurately captured the comments and suggestions, and to discussion recommendations to resolve the comments, four additional public meetings were held in the year 2000.

After these meetings, the NRC took the issues report, the recommendations and comments, and began an extensive what we call planing phase for the package performance study.

The first major product of this planning phase for the package performance study is the topic of today's meeting, and that is to present the draft test protocols, and to receive your comments, your views, and your suggestions.

At our first meeting on the draft test protocol, which was last week and held in Rockville, we heard from stakeholders that it was not clear what we mean each time we stated that the package performance study was in part developed to improve public confidence.

The following are a few of the comments on the project that we hope can do this. First, I would like to emphasize that the package performance study is the first large NRC research project with significant public input and participation in the scoping, the planning, and the protocol development.

And as we will be discussing later today that public participation is envisioned to carry forward into the test conduct and evaluation, and the end results.

We are attempting to provide information to the public about how the tests relate to current regulatory requirements, and will demonstrate further how the NRC certified and approved designs are even under conditions that exceed regulatory design requirements.

It is important that we consider the test conditions and ensure that we create them to real accidents and real live conditions, so that all of us can understand what the tests represent and what they don't represent.

We as well need to convince ourselves, as well as stakeholders, that the program is an appropriate use of taxpayers and ratepayers money, and that the tests are useful and meaningful.

In the conduct of the study, we provided feedback on public inputs and we modified plans based on comments and suggestions from our stakeholders. We as well plan to invite stakeholders to witness the tests, and to see firsthand and better understand the conduct and the results.

Reports and other communication tools were used to inform stakeholders about the results, and what we would do with them as a regulator, and how they will affect the safety of future shipments of spent fuel.

Now, what do I see as a success for today's meeting. The package performance study draft test protocols report summarizes the fuel tests that the NRC has proposed to perform under the study as the policy analysis to be performed to develop the test summaries.

The tests that we propose involve previously NRC certified and developed cask designs, and are not directed, and are not related to the NRC certification of any specific task design. We have issued this report for a 90 day public comment period, which ends on May 30th of this year.

And the report and comment period were announced in the Federal Register that we published on February 21st, along with many notices, a press release, and a mass mailing of over 500 copies of the package performance study test protocols to those on our mailing lists.

The report is as well available on the PPS webside. I would add that if you are not on the package performance study mailing list, and would like to be, please sign up with the staff at the desk, or with any of the NRC staff that are here with us today.

The purpose of today's public meeting is to obtain comments on these draft proposals. I emphasize that no decisions have been made yet, and let me repeat that as well. This is a major topic, where we spent some time discussing at the meeting in Rockville last week.

The draft test protocols are drafted as protocols. We have not made decisions on what tests for the parameters and conditions for the test, and the purpose of our meeting today was to ask for your views, comments, and suggestions so we can consider them as we move forward.

As Chip mentioned, I am happy to see such a large group of qualified participants on the panel, on the roundtable, as well as in the audience, and I am confident and hopeful that the comments will help the NRC develop the best and most appropriate test plan for the package performance study.

And finally let me know that we are also interested to hear from you if you found that this meeting and its format are useful and productive or if not.

The meeting evaluation forms are at the back or at the side table with the other handouts, and I would encourage you to please if you could to take the time and fill those and give us feedback on your perspectives on today's meeting, as well as suggestions if you feel that there are areas for improvement, and how we could modify or change these meetings to make them more productive.

However, if you opt not to provide the valuation forms, but you will later be providing written comments to us on the draft test protocols, I would encourage you as well that it is acceptable to include any comments on the conduct of tonight's meeting in those comments as well.

I thank you and look forward to a very productive meeting.

FACILITATOR CAMERON: Thank you, Bill, and I would just ask all of you to just bear with us and let us get the rest of the context out, and then we will go for questions for everybody.

And I wanted to remind people, and I don't think that I emphasized this before, is that because we are taking a transcript, obviously anything that you are going to say is going to be recorded on that transcript, which will be publicly available.

And when we do go out to the audience I would jus ask you to give your name and affiliation, if appropriate, so that we can have that on the record. Yes, Bob?

MR. HALSTEAD: Chip, when is that transcript going to be available do you think?

FACILITATOR CAMERON: Good point. When will the transcript, for example, from the Washington meeting be available, and when will this one be available, and in one form.

And I am getting seven working days from the stenographer, who has to do the work, and so that is probably a good data point there. Seven days to the NRC, okay? And when this will be available on the website or for distribution?

STAFF MEMBER: I don't have an exact date, but we do get an electronic copy of the documents, and so we will put that on the website as soon as possible.

FACILITATOR CAMERON: Okay. For this meeting, it should be available and on the website by the end of next week. And the transcript of the Washington, D.C. meeting -- Amy, can you answer that?

MS. SNYDER: Yes, I can answer that. What we will do is put the transcripts from each meeting on the package performance website, study website, and in addition it will be on the Adams Systems, and we will do that within a few days from when we get it from the court reporter.

FACILITATOR CAMERON: So possibly the beginning of next week. Judy.

MS. TREICHEL: Well, I will hold off on my questions until the other speaker speaks and you are opening it up, but change the word storage on the top of the agenda to transport. We are not here to talk about spent fuel storage casks, I think.

FACILITATOR CAMERON: That is a pretty excellent point, Judy. Thank you, and so noted, right?

MR. BOYLE: Our apologies.

FACILITATOR CAMERON: Okay. Let's go to -- we are going to go to Dr. Andy Murphy, who is from the Office of Nuclear Regulatory Research, and he is the project manager for this study. And as Bill Brach pointed out the spent fuel project office is assisting the Office of Research with this project.

Andy's career has been 24 years with the NRC, and his career has been focusing on earth science, seismic, and structural engineering issues. And he has managed a lot of large scale test programs for reactor systems, and components, and other types of activities, and that's why he has good expertise in terms of managing this particular testing program.

And before he joined the NRC, he was a research scientist at Columbia University at the Lamont Doherty Earth Observatory there. His bachelors degree is in geophysical engineering, and has a graduate degree in seismology, and Andy, I will turn it over to you now.

DR. MURPHY: Good morning. I would like to welcome all of you, and this first view graph indicates that we are talking about transportation casks, and that's for sure, and we are going to be talking about a program that we refer to as the package performance study.

I will try not to hit you with the jargon of the PPS too often. The other folks listed on there are the ones that have worked with me in developing the test protocol plans that we will be talking about today.

We have mentioned the Federal Register notice for this program for the test protocol report that we will be talking about, and there are a number of names and contacts listed in there. I am giving you this as the principal point of contact or the plan of contact of last resort.

Remember this one, because I will make certain that if you have questions or comments that they will be answered. So what topics am I going to be talking about this morning?

That is the objectives of the program, and our current status, the staff proposal, and we will be talking about both the impact and the fire tests, and some specific issues that the staff has identified for which we are looking for a comment from the public.

And the public here means everybody, and that includes on both sides of the public table, in the United States and internationally. This is a very large and important program, and we are seeking comment so that we are able to do the best program that is possible.

And I think you heard that this is an expensive program, and we are trying the best that we can to get all the input so that we can get it right when we carry it out.

The objectives. We have talked about these again a little bit this morning, and we will mention it one more time, is that we are attempting the best that we can to enhance the public confidence in the NRC's ability to safely regulate the transport of spent nuclear fuel.

We are trying to impress upon you the inherent safety of the certified casks. We are also trying to validate the codes and models that we use to look at how these casks will respond in the case of accidents.

We will be carrying out what we call extreme mechanical and thermal tests on these packages, and we are carrying this out to validate them, and to enhance public confidence, and also to refine the data that we have available for us to carry out risk estimates.

Ken Sorenson in a moment will make a reference to NUREG CR 6672, which is a recent study carried out by the NRC, or commissioned by the NRC and carried out by Sandia to look at risk estimates.
We wish to refine the calculations there.

We are also interested in emphasizing the need to accept some level of realism in the accident scenarios, or the accidents that we take a look at, and the conditions that we take a look at in these test programs, or in this test program.

Let me come to that point a little bit later as it came up with the others. The next view graph. The status. I wanted to tell you that at this stage that the staff does have a proposal on the table, and it has been published as the NUREG that we are talking about today, 1768, and that is our preliminary draft test plan.

The staff, with the assistance from Sandia, has put considerable thought and effort into developing a specific test plan, test proposal, and it represents at this stage a lot of effort and the best thinking that we have been able to put on to this program.

As Will indicated, this is our best effort, but we are very definitely interested in getting public comment. If we can, and I suspect we can, improve this package, we want to do that before it is carried out.

Just one more time. The package is available. If you have access to the internet, the address listed on there will give you direct access to the protocol report, and there is a link at that site to take you to a comment page, where you can simply thread in anonymously if you want your comments on the protocol report that will be recorded, and will be available to the staff to evaluate and to implement as appropriate.

Bill did mention, and I will mention it one more time, that we have got it out for a 90 day public comment period, and that goes until the end of May. What is going to happen with the comments when they come in, we will use them as I said to develop the detailed test plans and procedures.

What we are going to actually be doing with these casks, with full-sized casks, with partial cask models, and then we will be making that detailed plan available, and probably again through the internet and through printed media as well.

The Staff's Proposal. Okay. We are going to be doing a test or plans to do a test on a rail cask, as well as a truck cask. We have selected the Holtec rail cask as a cask to potentially be used in the program.

It is not fixed, and we have to pick a cask in order to carry out the realistic simulations, the calculations, the analysis, that we are required to put together this test protocol, but it does not amount to I'll say a specific endorsement of the Holtec cask or a commitment to use the Holtec cask at this stage.

Back in our meeting, one of our public meetings, at the time of the issues report, one of the NRC staff managers made a commitment that we would be using a cask that was certified and that a reasonable prospect of being used for actual shipment.

It was not going to be an obsolete cask sitting in the boneyard someplace. The points about the rail impact test that we will be using, and we are proposing to use an actual cask, a precise cask, and we will be dropping it from a tower.

This tower will be 250 to 300 feet tall, and we will be dropping that so that we can obtain an impact velocity of 75 miles an hour. Our plans are to drop the cask, and I don't have my coke can, but to drop it on an angle so that the corner lid of the cask hits first, and what is called a CG, center of gravity-over-corner impact.

We will be dropping it to obtain at this stage a proposed speed of 75 miles an hour on to an unyielding surface. The unyielding surface has been chosen so that we do not have to model what happens to mother earth when we drop this thing on it.

The analysis is complicated enough, and just simply looking at what the kinetic energy from a fall does to the cask, and we do not want to complicate our program, and our analysis, to try to decide what happens to the ground when this thing hits it.

That is why we have gone to an unyielding surface, and the unyielding surface also has the effect of basically doubling the impact speed of the cask when it hits this target.

So we are talking about the equivalent of about 150 mile an hour collision between the cask and a target. The package at this time as we propose will carry at least one surrogate fuel assembly, and what do I mean by a surrogate fuel assembly?

And that is a fuel assembly that would be basically visually indistinguishable from an actual fuel assembly, except that it will not have actual spent fuel on it. We will have a replacement for that.

In the case of the Holtec cask for the pressurized fuel, the pressurized reactor fuel, that cask holds 24 assemblies, and we propose to have one of those assemblies be the surrogate, and the other 23 would be dummies.

And basically they would just be simply rate and density replacements for the fuel assemblies. Next is just a simple representation of the Holtec Hi Star 100 rail cask, and that is this fellow here, made of about at least five layers of -- this shows six, but five layers of steel, and the lid, and the shielding.

And on this side you have the multipurpose canister, shown be in inserted into the cask, and if we do the Holtec as proposed, we will be using MPC, a multipurpose canister, in that unit.

This is what a Holtec looks like on a rail car. The carriage actually for the rail car for actual shipment would not be this one. The cask would be at a much lower center of gravity, down in this area, and so it is a different carriage there.

The proposal for the truck carriage, or the truck impact, and we will be making use of a General Atomic GA-4 truck cask. Again, we will be using an actual cask, and we will drop it from the tower, and the orientation, and some have been calling it a backbreaker, but this is an orientation that will bypass the impact limiters.

If you take a look at the model that is outside on the truck, that would be dropped like it is shown, and then there would be a projection like a concrete couvert, and it would be a semi-circle, semi-cylinder, and probably clad in steel, with concrete on the inside.

So again it would be an unyielding part of the target, and it would again be mounted on the unyielding target that we would be using for the rail cask.

The orientation, again, a backbreaker; and proposed speed, 75 miles an hour on to an unyielding surface, and again this would be like I said equivalent to 150 mile an hour collision.

We would have one surrogate assembly in there, and that is one of out four, and so three of them would be dummies. Here we have a nice color picture

of what the GA-4 looks like, with the impact limiters, and the fuel assemblies in here, and the various other components that make up the unit.

The staff is proposing to carry out a thermal test, and the thermal test will follow in the sequence after the impact test. We will be testing both casks, and we will be using a fully engulfing, optically dense, hydrocarbon fire. What does that jargon mean?

That means that the cask will be fully surrounded by the fire, and that you will not be able to see through the fire to the cask. What difference does that make?

Well, that means that physically the heat that is generated is not -- is in effect all going into the cask. But that the fire that is surrounding the cask will go into making the cask hot, and with that stumbling, I will say that Chris Bajwa a little bit later on will give you a far better explanation of that.

And the hydrocarbon fire, that's easy, and that just simply means that it will be an oil-based, jet fuel-based, fire. The duration that we are proposing at this stage is more than a half-an-hour.

The half-hour would be necessary for us to see the trends in the heat up of the cask at various points within the cask system; on the inside, and the outside, and on the assemblies and so forth.

So that we would have a very good idea of what is happening, and how the cask is heating up, and how the energy from the fire is getting the cask to raise its temperature.

Specific issues for comment. These are listed several times in the protocol report, and so I will not go through them here, but Will mentioned something -- this is a change from the viewgraph that we used in Washington.

We observed that there was considerable comment that we should be thinking about testing for failure. This is an issue that we had not previously identified and put on here, and so making emphasis here that we would be interested, very interested, in getting comments on the proposal to test the cask for failure.

There is obviously also the question in that what does failure mean for this particular condition, but again a point being added to the comments. And that concludes my presentation at this time. Thank you.

FACILITATOR CAMERON: All right. Thank you very much, Andy. We have one more presentation for you, and then we will go to you for questions. Our next presentation is going to be by Mr. Ken Sorenson, and he is going to give you some more specifics on the test protocol.

And as I mentioned, we are getting some expert help from Sandia National Laboratories, and Ken is from the Sandia National Laboratories, in the Transportation Risk and Packing Department.

And that help involves computer analysis on how a cask might perform, and testing of casks, risk assessment. And he is on the editorial board of the International Journal of the Transportation of Nuclear Materials Packages.

And he is also the chairman of the Package and Transport Division of the Institute of Nuclear Material Managment. And he has a Bachelors degree in Civil Engineering from the University of Arizona, and a Masters degree in Civil Engineering from the University of Arizona.

He also has a Masters of Business Administration from the University of New Mexico, and with that, Ken, go ahead.

MR. SORENSON: Okay. Thank you, Chip. Good morning everybody. On behalf of Sandia, it is a pleasure to be here this morning, and we are looking forward to the discussion and also to getting your comments and feedback.

At our meeting last week at the NRC headquarters, I think we had a very good day, and as Andy mentioned, we had a lot of good feedback I think, and already we are starting to look at that, in terms of how we can construct the protocols, and then the testing, so that we meet the broadest range of issues and concerns to meet the objectives of the package performance study.

As I said earlier at my introduction at the table, Sandia is the technical organization supporting the NRC on the package performance study. All the analysis that you see in the protocols was done at Sandia, and I do recognize those who actually produced the analysis and the reports, and those are Doug Ammerman and Bob Kalan, Carlos Lopez, and Jeremy

Sprung.

My way of background, I would like to form a little time bridge if I may between the year 2000 and where we are today with the protocols. In 2000, as Bill Brach mentioned earlier, is when we issued the reexamination of spent fuel shipment risk estimates, and that is in NUREG CR6672, and if you would indulge me, I will just call it 6672 at this point.

And we used these estimates at public meetings, and I will talk more about the public meetings, because it is important, because they have a lot to do with where we are today in protocols. But we used a series of public meetings before the 6672 was published, and then four weeks after 6672 was published, to get comment and feedback on the document.

And to use that then as a springboard to go forward with the package performance study. And indeed these public comments that we got really did set some stakes in the ground that provided some guideposts for us to structure what you see today, in terms of giving us some direction, general direction, on how best to proceed.

In those meetings, there is really -- it all boils down to two little basic comments that we got back, both from the technical people and from the public, and first of all that is shown is that you need to do a better refined analysis to better capture a transport cask response to these very severe mechanical and thermal environments.

It is important to point at this point that 6672 and the protocols right now as they are structured, do not cover loading conditions as specified in the NRC Regulations, 10 CFR 71, and they are mainly conditions that are more severe than the conditions that are in the regulations.

The second general comment that we got was that it was important to do field testing, and to demonstrate the ability of the analyses to capture cask response in these very severe mechanical and thermal environments.

And also to provide a demonstration of the robustness of the designs, and the result in casks in these very severe moving environments. After the round of public meetings, we assimilated all the comments and put them out as an issues report, and that literally provided the benchmark for us to go forward and structure the package performance study.

The issues report was phase one in the package performance study, and now the second part as you see today is the protocols. In the issues report, there is five main recommendations that came out, and that again kind of formed the basis of where we are today in the structuring of the protocols.

The first two are to perform very refined comprehensive 3-D computer analyses to capture the cask behavior in extreme mechanical and thermal loading environments.

Some of the comments that we got back from 6672 was that, for example, that the fire analysis that we used was a one-dimensional fire analysis, and we had a lot of comment that you really should do a better 3-D type of analyses.

For the mechanical loadings, we had to -- for the clonal end of the modeling for the cask, we had a relatively coarse model that was due to some funding and schedule constraints.

And so that was recognized and it was one of the public issue comments that we got, and recommended in that issues report that we needed to do a more refined 3-D analysis of the mechanical loadings on the cask as well.

And then we heard a lot that you need to do testing, and not just any old testing. You need to do testing of casks that would be currently certified NRC casks, and it would be casks that would be used for large transportation campaigns, and like to Yucca Mountain, for example.

And so one of the main recommendations is to do testing, and to do it both for mechanical impacts and also for the thermal tests. The test protocols that you have today are the proposed test parameters for your review and comment.

After we assimilate the comments that we get from the public meetings that we have, then we will develop some defined test procedures that will actually define the tests that we will then conduct.

The fourth comment was to conduct fuel testing experiments to see how the actual fuel assemblies themselves performed in these severe mechanical and thermal environments. There is not a lot of test data available frankly in terms of how fuel assemblies perform under these extreme loading environments.

And that, fifth, is to reconstruct the accident event trees and accident speed and fire duration distributions. A lot of comment that we got back that the data that has been used in 6672 and previous reports is dated. It is 15 years later, and there have been changes in important things, like speed limits have changed from 55 to 70 or 75 miles an hour.

And so it is important to go back and look at those accident distributions and make sure that there has not been any dramatic changes, or if there have been, to incorporate those in the risk studies.

The protocol that you see before you really involve the first three recommendations. Recommendation 4 and 5 from the issues report are not part of the test protocols. The impact tests on the fuel is on a different schedule, and the accident event trees and the accident speed and fire duration distributions is not a test activity, and so that would be performed separately from what you see in the protocols.

So today's discussion really does revolve around the first three recommendations; the computer code analyses for the severe mechanical and thermal environments, and also then the type of testing that is being proposed.

So the document that you have before you today, the test protocols, the three main functions of that document is basically to stimulate your thinking on how to perform, or to develop, or to define these tests that we have proposed.

And part of that is to identify candidate casks for the tests. In the issues reports, you may recall that we talked about one cask test with a rail cask in the protocols, and that has been changed, and there is actually now discussion about doing both the rail cask and the truck cask tests.

In the protocols, we describe the concepts for the impact and the fire tests. You may read these, the protocols, and be thinking to yourself that there is not a lot of definitions, in terms of what is the failure criteria, and those sorts of things, and there is a range in speed for the impact.

And we did that on purpose. We didn't want to set specific test parameters. We really wanted to provide more of a range so that we could get public impact or public discussion on that.

And then we used computer analyses again to help define the orientation of these candidate cask drops, and speed, and those sorts of things. And then finally we used the protocols to solicit public opinion or for public comment.

I have a couple of pictures of the computer code analyses here, and again just to stimulate a little bit of thought on your part for the discussion period. This is a picture of the Holtec Hi Star cask, and Andy talked about the center of gravity-over corner impact, and basically tried it up instead of down.

But anyway it is to represent or simulate a drop test enter of gravity-over-corner of the cask, and with the impact limiter, and you can see that we get a lot of good information out of the impact limiter.

This is at 75 miles per miles and which is the recommended drop speed for the high speed impact test in the protocols. This graph here shows the acceleration on the cask, and we did body acceleration on the cask or deceleration if you will as a function of time.

And this plot is the actual deceleration of the cask, and this is all through analysis again. And you will see that we get an acceleration of that cask at about 100 G's. We also did a drop test analysis on the very same cask at the regulatory 9 meter drop, and that resulted in an acceleration on the cask, and reached an acceleration of about 30 G's, a little over 30 G's.

So as you can see, in this particularly recommended orientation for this particular design, the speed, we really do have a severe test on this particular package relative to the 9 millimeter drop test in the regulations.

This is the GA-4 truck cask, and as was mentioned earlier, this was a decision by the NRC to include the truck cask after the issues report was actually published. We were looking for an orientation, a drop test, that would provide us some new information relative to what we were planning on getting with the rail test. But we just did not want to repeat the same test.

And this is an example of how the issues report in the public comment period really helped in deciding that on this particular orientation, because one of the comments, or a lot of the comments that we got from the public was what about an accident where you bypass the impact limiters.

And the perfect example is what we call a backbreaker test, and as Andy mentioned earlier, you could visualize that as a bridge above it perhaps, with the cask traveling transversely, and hitting this big bridge abutment, and the impact numbers really don't come into play on that.

And so that is why we are recommending this particular orientation for the truck cask, and we think that it really will give us some added information in the performance of these types of casks.

And you can see here again the

acceleration plot versus time, and you get a pretty high acceleration of 150 G's max, and then an average acceleration of about 100 G's on that particular cask.

And in this analysis, we did not include the impact numbers, although the mass impact numbers are included in the cask, and so we have an accurate simulation of the mass while dropping it as that particular speed.

Again, we used 75 miles per hour as the proposed cask speed for the impact on that cask. This is some analyses for the fire test, and this is the Holtec Hi Star cask here, and the three analyses shown here on the left, this is one meter above the pool fire, and this is an analysis with the cask on the ground, which is pretty probable if you were to have an accident and followed by a subsequent fire.

And then this is with the cask 3 meters above the pool fire, and that probably from a realistic standpoint is not highly probable, but we have been looking at the environment, and how the cask responds to particular environments.

The thing that we are looking at here is what is called a vapor dome, and this is the relatively dark area underneath the cask, where you do not get complete combustion of the fuel.

There is not enough oxygen to combust all that fuel mixture, and so you have relatively cool air underneath that cask where that vapor dome is. So at 3 meters, we were looking for what would happen if we got the cask above the vapor dome and see how that affected the surface temperatures of the cask.

This particular picture is shown at one meter by the pool, and you see a relatively cool area underneath the cask where that vapor dome is, and then higher temperatures on the top surface.

This is a graph of the surface temperature at different locations on the cask as a function of time. And for these analyses, we took them out to one hour, 60 minutes for these particular analyses.

And again there has been no decision made in terms of how long to do these fire tests, or at least the orientation of the fire tests and those sorts of things. As Andy said earlier, at this point the proposal is to make it longer than 30 minutes.

And then just to wrap it up and tell you about some of the technical reviews that we have had on the protocols to get us to this point, and we have had a fair amount of reviews internally, and by external technical people as well, to get their feedback and comments.

And we first introduced the protocol type process and the package performance study at PATRAM '01, and PATRAM is an international transportation conference that is held every three years, both internationally and in the United States, and it happened to be in Chicago.

Rob Lewis from the NRC gave a plenary on the package performance and what the NRC plans were for this particular program. In April of last year, about a year ago, we had two expert review panels review the draft protocols at Sandia.

And one was a structural panel, and one was a structural panel, and the other was a thermal panel, and we had people from industry, and people from academia, review the technical aspects of the protocols, and we got their comments back from them and incorporated them into what you see today as appropriate.

In June of 2002, we also made a presentation to the Advisory Committee on Nuclear Waste, and then in June again of 2002 we also made a presentation to the National Academy of Sciences. So that concludes my talk, and thank you for your time.

FACILITATOR CAMERON: Okay. Thanks a lot, Ken. Let's go to Bob Halstead for our first question on the presentations. Bob.

MR. HALSTEAD: Well, I have a statement on the matter of transportation and risk reexamination as it is presented in the document known as NUREG CR 6672, and I will have a question at the end, Chip. Now, most people in this room are not familiar with this report.

It is a very important report, because it is the foundation study, and so pretty much everything that we are talking about in the package performance study.

For those of you who have not read it, it may surprise you to find that the NRC study written by Sandia concluded that the risks of transportation of spent nuclear fuel were basically one-third of the risks identified in previous NRC studies.

And we reject that conclusion, and we reject the process that was used to prepare that report, and we believe that the NRC is misusing this report. We know for a fact that the Department of Energy is misusing this report.

And please bear with me while I go through six points of analysis, because it is very important that we not only understand the technical deficiencies in this risk assessment report, but that we understand how important it is that the NRC not repeat the defective public participation process that precluded the State of Nevada and other stakeholders for having a say and perhaps preventing that report from making the mistakes it makes.

First of all, the draft and final reports were prepared at Sandia National Labs under a veil of secrecy. The State of Nevada on at least three occasions requested the opportunity to review the draft report, and we were rejected.

Secondly, the NRC staff, when asked about the report in public meetings around the country -- and, Bill, I personally had this exchange with Corbin Harney, now retired, but to many people in the business known as one of the most respected NRC staff people in this area, simply said that he was not allowed to talk about the report.

The third point is that the NRC refused to issue this very important report as a draft report for formal review and comment.

The fourth point is that neither the NRC nor Sandia National Labs have responded to the more than 25 pages of detailed technical criticism provided by the State of Nevada and Clark County.

And point five is that we are very specifically concerned that neither the NRC nor Sandia responded to the list of 21 very severe historical highway and railway accidents which we believed created forces that exceed the cask performance standards, those standards that are supposed to protect public health and safety that are in the NRC regulations.

And point number six is that we believe that the NRC staff and Sandia, in their use of the risk examination report, generally and specifically in this proceeding appeared to be using NUREG CR 6672 as if it had formally supplanted the previous legal basis for risk assessments and environmental impact assessments, and we believe that directly contradicts the policy statement made by Chair Meserve in a letter to my boss, Bob Lutz, dated January 2nd, 2001.

I won't belabor you by reading the letter, but I will have it placed in the record and put on the website. The bottom line here is that these risk estimates are so low that they undermine my confidence as an analyst, and the confidence of many other stakeholders in the process.

And ironically the NRC's own advisory committee on nuclear waste, as I read the transcript of their June 28th, 2002 meeting, came to the conclusion that, wow, if the risk are this low, why in the world are we talking about spending millions of dollars testing these casks.

Unfortunately the risks are not that low, but unfortunately the Department of Energy has already adopted this report, in contradiction to the policy established by Chairman Meserve as if it were a final revision for the basis of this assessment.

Today we are putting the NRC on notice that we will hold you accountable to the policy position taken by the Chairman when the NRC presents its license application.

And if they continue to use NUREG CR 6672, you will have to defend the credibility of this entire program. The way that we read it, NUREG CR 6672 is at best a working document or a working hypothesis which you intend to pursue through the package performance study full-scale testing.

But this report is being misused by the NRC and DOE and it undermines any basis of public confidence in the risk assessments that are being made by the Nuclear Regulatory Commission. Thank you.

FACILITATOR CAMERON: Okay. And I would just -- and this is very important obviously for the NRC here, and what I would like to do though is to try to see if there are any questions out here and -- and I will get back to that, but I just wanted to remind people that this part is about questions, and then we get to the next discussion segment, we want to hear all of the statements, like Bob's.

And I guess when we do get there, I would like the NRC to perhaps talk about the relationship -- Bob raised a lot of points about that report that go to the report, but there is also some generic lessons perhaps, and that's how we started out, but the most important thing is how does that report drive if it does at all the draft test protocol. Now, Jim, question?

MR. CHANNELL: Yes. I had a question on a clarification. In reading the background material, it was not completely clear to me whether the fire test was going to be with tasks that had been subject to the 75 mile per hour impact tests first or not.

Sandia made some arguments about the problems of perhaps doing these fire tests with a damaged cask, and so I just wanted to clarify or ask the question of what the current proposal is.

FACILITATOR CAMERON: Go ahead, Andy.

DR. MURPHY: The current proposal is that it will be a sequential test. We will take the cask that was used for the impact test, and put it in the fire test. It will be impact, followed by fire, with the same task.

MR. CHANNELL: If you lose containment in the impact test, you won't be able to test what the fire test had on containment.

DR. MURPHY: Yes, we are aware that there are numerous technical issues that will have to be addressed in making any final decisions on how these tests will be carried out, but right now specifically the staff proposal is to do the impact test, followed by the fire test.

MR. CHANNELL: All right.

FACILITATOR CAMERON: Let's go to Judy, and then Cash, and then I think we will go to Bill. Judy.

MS. TREICHEL: First, I want to make the statement that twice it was mentioned that this is talking about transportation to a repository, and then specifically to Yucca Mountain. The task force will not cooperate and/or participate in anything that is cooperation of getting waste to Yucca Mountain.

We absolutely oppose that, and the reason that I am here and possibly others at the table is because we believe that there needs to be safe transportation of spent fuel and high level waste for safety reasons.

And I think there are going to be occasions when that stuff needs to be moved, and I think the casks should be capable of doing that, and I think the public should have confidence that DOE or whoever it is, a utility or whatever, it able to use a certified cask certified by the NRC that is safe.

That is the reason that I am here, and that is why I am participating in not any way to further or give the public confidence that Yucca Mountain is a good idea, and I want that on the record first.

FACILITATOR CAMERON: All right.

MS. TREICHEL: When you showed one of the slides, and I think it was in the second presentation, you showed an MPC inside the shipping container. Is that to be the situation with any of the tests, and will it be done without the MPC inside?

DR. MURPHY: We are proposing two impact tests; one with the GA-4, which does not have an MPC associated with it, and the Holtec, which does. We are testing the units as they are to be used in a certified campaign.

And part of the reasoning here is that we are attempting to challenge the capabilities of the codes and we wanted to see how well they would perform with an impact limiter, or excuse me, with a multipurpose canister and without, and it was a good observation that the Holtec does have the multipurpose canister associated with it, and it will be tested that way.

FACILITATOR CAMERON: Thank you. Bill, did you want to say something before we go to the rest of the questions, or --

MR. BRACH: Yes, I do. I want to preface my comments first, because I don't want this to sound or come across as a point/counter-point type of discussion or interaction.

But a few of the comments that Bob had mentioned I do believe warrant some comment or response. First, NUREG CR 6672, I briefly mentioned it, and both Ken and Andy made reference to it in their discussions as well.

That was a report that the NRC issued in March of 2000. It was a report as Ken has mentioned that we had a contract with Sandia National Laboratories to conduct and prepare, and it was not a report, and in the process it was not an activity that we have as a public participatory process that we have today.

You might recall one of the slides -- and that is an active public participatory process, and it fairly contrasts our generation of the contract report that was an NRC and Sandia activity to the activity that we are carrying out today, and that report was an NRC-sponsored study issued as a contractor report, and it did not have -- and it was not planned to be issued for public review and comment.

Bob also mentioned that there were a number of comments that both the State of Nevada, as well as a number of other folks, that were raised to us on the NUREG 6672.

I would offer and recall to some of the folks that are here that when we issued the issues report on the package performance study in June of 2000, we at that same time actively asked for public review and comment on 6672 as part of that second series of public meetings that we had on the package performance study.

And we did get from a number of stakeholders, some that are here today, and some in other arenas, comments on that report, and those reports are listening to those comments and factoring into, and considering in our plans for the package performance study for the types of tests that should be carried out.

And as Ken had mentioned, part of the risk analyses that we carry out with the information that we have gained from the package performance study. So I just wanted to clarify those points, and the last point that I would make reference to is that in my discussions as well, I know that the NRC has conducted three transportation studies in the last 25 years.

I didn't identify those specifically, but the very first one was the environmental impact statement that the NRC, actually in cooperation with the Department of Transportation, predated back in the 1970s.

That EIS formed the basis and continues to form the basis for our regulations in 10 CFR Part 71 for transportation. Subsequent studies, the mobile study in reference to the NUREG 6672 study, those were not supplants for, and did not take the place of the EIS, and it was merely based on NRC's and our contractor's review and analysis, and continued to provide to us information that supports the continued validity of the environmental impact statement we issued back in -- I believe it was 1977. Thank you.

FACILITATOR CAMERON: Okay.

MR. HALSTEAD: Chip, can I make just a quick response and I won't tie this up. I appreciate that clarification, Bill, and you have gotten right to the point that is important to us. I am not sure that it injures the State of Nevada that there is a report out there that we feel is wrong and with the deficient public process in and of itself.

It injured because the Department of Energy and other entities are using this report as if it were a final report, and again you may not have even seen the Chairman's letter.

You might have written it, but I noticed that with many letters that there is no carbon copy list on this. And what the Chairman said is that as you said, NUREG 0170 and Table 4 in the regulation continue to be the NRC's basis for this assessment.

The problem is that when the NRC puts its name on a contractor report that it is such a powerful endorsement that people pick that report up and cite it as if it were gospel and validated by full-scale testing, which it is not.

I personally had to take a statement from a Department of Energy contractor at the waste management conference in Tucson last week, and that some people were there and witnessed, in which this document was cited as the definitive statement on risk.

And furthermore the Department of Energy used this in their final EIS, which was delivered on Valentine's Day last year. So contrary to the Chairman's view, there never was an opportunity for the public to challenge the way DOE used this.

So I want to proceed with this study, but I want to make it clear right now that the foundation document of this study has been challenged by many people on detailed technical grounds, and I appreciate the fact that you seemed to have learned that this was a bad way to do public participation.

And I will say that the way that you are conducting this meeting, this process is the way that you should do it. Nonetheless, we believe it has injured the State of Nevada and its residents that this report is out, and it can be misused by any number of parties, including the Department of Energy, and FDIS, that will probably be submitted to you as part of a licensing package.

FACILITATOR CAMERON: Okay. Let's try to keep this on the relationship to the test protocol and forward moving. And I think that Bob has made a couple of relationships there, but when we get to the next discussion period, maybe the specific information that people would want to know from the NRC is how does this NUREG influence the draft test protocols, and I don't want to get into that now.

But I think that is the type of information that we need to get at. Let's go to Diane, and then Cash, and then to Bonnie. Diane.

MS. NIELSON: Thank you. I am going to make an assumption here, and if I am incorrect, that may answer the question. We are talking about testing these new casks, and I appreciate that we are talking about sequential testing.

But I am not hearing anything about testing of used casks. When the State of Utah reviewed the proposal for PPS, for present fuel storages proposed facility, their intent is to reuse those transportation casks.

And if that is in fact the way that the operations will ultimately be approved, then I would like to understand what the NRC's plan is for a testing regimen for used casks, and their components, and particularly the components that are likely to be stressed through use such as the bolts.

FACILITATOR CAMERON: Great question. Andy, Ken, Bill? Bill Brach.

MR. BRACH: Well, first to clarify, your understanding is correct. The tests that we have described today would be tests of newly fabricated packages, and again the question as Andy had said was that the draft proposal would be a Holtec rail task and a GA for truck cask.

Now, going directly to the questions that you have raised with regard to testing of used casks, I want to stress that the package performance study, and I tried to identify this from the opening comments. the purpose of the study is not to determine or validate if you will the adequacy of the current Reg rules and regulations.

We are very comfortable based on the current rules, and regulations, and standards on the current use of spent fuel packages. And that includes if you will the reuse.

A certificate for a transportation package is issued for a 5 year period, and at that time the certificate holder is required to come in to request a renewal or to request modifications of that package design.

And that goes through again another NRC review of that certificate. And that would include as well if there are any conditions of use that would raise a question with regard to the continuing ability of that package design to meet its form, fit, and function with regard to materials, and use would be a question that would be looked at with regard to any questions that might be outstanding with regard to the continued use of a cask that has been used in multiple events or multiple occasions.

FACILITATOR CAMERON: Diane, does that answer your question, or do you have a follow-up to that?

MS. NIELSON: I appreciate the process. I guess with that response, my request would be that you consider full-scale testing of a used cask, or that you consider establishing along with this protocol a protocol that would include a scheduling of review and examination of casks.

And not just an assumption that if the cask passes the test initially that it will be able to sustain that performance for the five years, or whatever it is estimated to be in use.

FACILITATOR CAMERON: And as a preview for our overarching issues discussion, from what I am hearing Diane say, is that if we have a realism objective for the test protocols, it is because that these casks -- that it would be more realistic to test used casks. Okay. We will go to Cash and then to Bonnie.

MR. JSASCZAK: Well, the discussions have yielded a certain amount from where it was when the question was prompted and it went to where Jim and Andy were talking. The first one was did their computer testing and their modeling, and then the full-scale test as part of this protocol, and that is basically one question.

The second then is if whether these are new or used casks, and I assume that there is a quality assurance program in place to address that point, because it doesn't make sense on anything that you do over a period of time to test it once and forget about it.

That you have some sort of a assurance program that there is rigidity, continuity, and integrity to this process, and that it is just the once and forget it.

I don't believe that is where you are going, and so in terms of the casks themselves, how do you get to the temperature, the internal temperature of the cask, whether it is the bent cask, the dropped cask, the fire, and when they are all put together, how do you do that, and how do you have assurances in the process that you have not destroyed your measuring process, if there is one inside.

And then the third question is that the

calculations of the 75 miles per hour, and from a Nye County perspective, not as the most affected county in the State, and not whether this is going forward or not, and we are making an assumption that it is, and we have to react that way, we want you to be as successful as possible so our safety and surety of this program is in place.

And we want that moral high ground, regardless of where the State goes on this issue, or where this whole program ends up, we want this to be a good protocol and a good test.

Therefore, we really want to have the input focused on that part of it, as opposed to the who shot John.

FACILITATOR CAMERON: Okay. Did you capture the three -- there are three questions.

DR. MURPHY: I think we got the three, and I will answer I believe the first two,and that is that first associated with predictions, we will be carrying or having our contractor, Sandia, carry out predictive analysis of what we expect to happen to the casks in the tests that are proposed, the tests that are carried out.

Those predictions and those analysis will be publicly available before the test happen, and it is our intent at this stage that it is the easiest to think about the impact test, that we will be having a tutorial for the public before we carry out the tests to explain what is happening and what to expect.

And then we will carry out the tests and if everything goes well, the folks will be able to approach the casks. If we had predicted a four inch dent in the cask associated with the drop, folks will be able to approach the cask and indeed see that there is a four inch dent.

Part of the prediction process will be a condition of the success for that prediction. We have not decided on what those will be. Let's say we are talking about a 4 inch dent, we will tell you that a 3 inch dent, or a 5 inch dent represents the range of uncertainty in our calculations.

The other question that you were asking about is QA. There will be very definitely a QA program associated with the work that the contractor is doing, and the calculations that they are making, and the whole process there.

There will also be QA programs associated with the manufacturer of the casks, and there is a QA program required for the purchaser of the cask so that we believe that you will be fairly well covered on the double-check that the process is assured, and that there can be confidence in that process.

And I will ask Ken to address some of the thermal points that you were making.

MR. SORENSON: Right now there are no plans to internally heat the casks during the tests, and some of the objectives are to be able to predict cask response to particular environments, and we want to demonstrate that we can do that with what has been proposed.

And adding an internal heat source is a relatively easy thing to do analytically, and we don't see that as really adding to the value of the technical part of this program.

MR. JSASCZAK: On one follow-up, how about the puncture tests that you are testing that is currently I believe not included in this process?

DR. MURPHY: That's correct. A puncture test is not currently included in the process. If you are making the comment that we should consider that, that will be for someone else, as someone has already made that one.

So, yes, it is beyond our agenda to address whether we should be doing a puncture test as well as the impact tests.

MR. JSASCZAK: So I head you say that has already been brought up in one of your other meetings, and so that is one of the things that is already part of the consideration process as you move forward?

DR. MURPHY: That is correct. That is a comment that we received, and we would be pleased to get a second comment to that effect if you would be kind enough to make it. We will have formal written remarks that will be done before the end that include virtually all of these.

FACILITATOR CAMERON: Okay. Let's go to Bonnie, and then to Mike, and then we will go across to Judy. Bonnie.

MS. BOBB: First of all, concerning the time of testing. I noticed that you put down half-an-hour. I just want to say that our reservation is located about 12 miles from one of the rail sites, or a little further than that, and I drove from there and it took me 6 hours to get here.

And you are proposing a thermal test of a half-an-hour, and I wondered about the rationale behind that. The other thing that I wanted to know is if you are talking about an unyielding surface, because any other surface (inaudible).

What is an unyielding surface, and isn't there a great difference between an artificial unyielding surface and the earth, because there would be a whole lot of damage to the water and the environment of the Yomba Shoshone Tribe, and the environment in that area; animal, people, plants, water, air, in a very large area.

And the question that came up in the midst of this is who are all of your consultants? Is it only Sandia, or are there others?

And the fourth kind of thing is kind of a comment on what you are saying about the predicted models. I think (inaudible) outside the known points. If I have a predictive model, my degree of certainty of what I am estimating in the future can only be certain within a range of the known.

I can be more certain within the range of the known, and you are (inaudible) very artificial situations. So how do you make predictions outside the range of the known, because we all know that the error increases, and what degree of error is expected?

FACILITATOR CAMERON: Okay. Four questions, and the last one is how are we dealing with uncertainty in the use of models. The first one was the thermal test, and the six hour drive. Ken, do you want to answer that, or Andy, or how do you want to answer the questions? Go ahead, Andy, if you have the answer.

DR. MURPHY: Let me start with the answers, and we will get some backup from Ken. The first one associated with the duration of the fire test. If you remember, and you probably were not able to see them, but the graph that Ken showed about the heat up of various points within the cask as time went on as the fire burned, we are interested to be able to validate our code and model so that we are able to predict at the various points within the cask and outside the cask what the temperature rise will be.

What are the trends in the rates of temperature rise, and if we are able to do that, we would anticipate that carrying out a six hour fire test, if that were the appropriate thing, we would be able to predict what happens with the temperature at those various points as time proceeded.

We have suggested at this stage just simply going beyond the certification test of a half-an-hour, and are looking specifically for comment on how long the test should be.

FACILITATOR CAMERON: The next one would be unyielding surface.

DR. MURPHY: The next one is associated

with the unyielding surface, and your concern I believe was that if we are talking about the real world, you were concerned that in the real world that a collision might occur on a yielding surface, such as a granite face or a layer of limestone.

And that we would not be on the conservative side, and what happens with the unyielding surface is that all of the energy generated in the accident, i.e., falling from the tower, would be transferred to the cask. So that would be the most severe challenge to the cask.

If we dropped it on a limestone layer, or we dropped it into a sandy soil, that would cause less damage to the cask. So in that situation you are less likely to have the cask lose containment than you would on the unyielding surface. So the unyielding surface is the more severe challenge to the cask.

MS. BOBB: But what would that finding be --

DR. MURPHY: On the unyielding surface? It would consist of a block of concrete, reinforced concrete, 30 to 40 feet wide, with the same depth, and a steel reinforcement on top of it. So that you are talking about a package that is nominally 10 times the weight of the object that is being dropped on.

FACILITATOR CAMERON: And the third question has to do with consultants, additional consultants; is that correct, Bonnie?

MS. BOBB: Consultants other than Sandia and are there any independent consultants other than Sandia.

FACILITATOR CAMERON: And by independent, you mean -- how are you using the term independent? Just so they can answer the question.

DR. MURPHY: Well, I don't think independent at this stage makes a difference in the answer, in that the consultants that we are using that had worked with us in the peer review that Ken mentioned, are listed in Appendix B of the test protocol report. They are there.

And I would ask you to repeat your question about the predictability of modeling so that I can provide an answer to you.

MS. BOBB: If I am going to make a model, I am going to build in factors in error, and I am going to make like kind of a regression (inaudible). If I have various data points that I can enter within certain ranges, and I have an unknown, and if it falls within the range of those known data points, I can make a fairly accurate estimate with a certain known degree of error.

If I am estimating outside the range of the known data points, my error is going to increase, and it seems like a lot of these tests are based on factors outside the range of the known data points.

DR. MURPHY: Okay. I understand what you are interested in, and I agree with you considerably, in that in my seismological work the prediction of ground motion at a site uses exactly the same process.

The process is very similar for a structural analysis. You are going from models that have been validated and proven to work very significantly for elastic collisions. These are collisions that the objects bend during the impact, and then after the impact is over and the forces are taken away, they return to their initial state.

Here we are interested in looking at plastic deformation. This is deformation that remains after the collision occurs. This is an area of more uncertainty than the elastic. We are talking about Sandia conducting analysis to predict what is going to be happening with these casks in plastic collisions.

The challenge would be to come up with the accurate estimates of what is going to happen. As I mentioned, we will get an estimate of what is going to be happening based upon the analysis that is done, and it is our intent to say, okay, this is our prediction of what is going to be deformed, and how much it is going to be deformed.

We will also do an analysis and say, okay, now well do we know the material properties, and how much uncertainty is associated with them, and that would give us an estimate of the uncertainty bands that we will publish as well.

As I have mentioned as a very simple example, that if the prediction is for a four inch dent, whatever that means, we will give an uncertainty band on that of say 3 to 5 inches. The dent would be in that range.

And that will be our prediction and that is what will be available before the test occurs.

MS. BOBB: Thank you.

FACILITATOR CAMERON: Okay. Let's go to Mike and Judy, and then I think we should go around and hear statements of participant interests. Mike, go ahead.

MR. BAUGHMAN: Thank you, Chip. I just have three quick related questions. The first would be what is the NRC's hypothesis regarding the outcome of the objective or the activity to obtain data to refine risk estimates, and would you anticipate the results of that leading to a reduction in risk estimates, or no change in risk estimates, or an increase?

DR. MURPHY: I think that would be premature at this stage to predict what the outcomes will be, and then what impact that may have on the regulations.

We are in a position that we are open to an understanding of what is going to happen. Let's say in a worse case scenario if it goes badly that the predictions are that the deformation is more than expected, and that has an impact upon the certification tests, we will obviously as an agency have to reexamine the certification process.

I will say that by the comments that it is appropriate to say that by comments and by our experience with the safety that we have seen in the casks so far, we don't believe that there will be that kind of a scenario.

MR. BAUGHMAN: Okay. In all the research there is a hypothesis going in, and this one sounds a little unclear, but your last part of the response I think was an avail (phonetic) hypothesis.

I guess the second one would be is what is the estimated cost of the PPS, including costs incurred to date through completion?

DR. MURPHY: I could give you some estimates on particular items, but at this stage, we are trying to focus on the technical merits first, and that is the way that we do our procurements, is that we want to get the technical merits down, and we want to get the best technical programs to start with.

And then we will address the costs that are involved. I think it is fair to say that Bob Halstead, at the meeting in Washington, suggested that the costs of the upgrades for the facilities at Sandia were between something and another and $8 million.

And I told him that, yes, that he was in the right ball park with those figures. I would not like to at this moment give you a further estimate because that might be interpreted as locking us into a particular test sequence, and we would like that to stay open and very much like to have comment on that.

MR. BAUGHMAN: So the NRC at this point has no estimate of the costs of the PPS as outlined in the document then?

DR. MURPHY: Yes, we do have an estimate, and our estimate at this stage would indicate that to do the testing as we propose would be more than $20 million.

FACILITATOR CAMERON: Okay.

MR. BAUGHMAN: The third question, Chip, is related to the first I guess. I am not real clear exactly what the NRC legal mandate is, and I did not have a chance to check it out before I came, but I assume in a nutshell that it is to protect the public health and safety.

And I guess I am wondering what the link is between protecting public health and safety and instilling public confidence. I don't know whether there is a causal link there if you will between those two, and I am kind of curious about that.

So let me just note -- and again getting back to the hypothesis, one of the objectives in the missions of this work is to instill public confidence.

I am wondering or I am assuming that your hypothesis in this case is that the work would lead to some enhancement of public confidence, and I for one have been one who when we had the previous hearings or meetings on the reexamination of risks, and we were heading down this path, I was critical of physical cask testing, and I think I remain critical to physical cask testing from the perspective of leading to public confidence.

And to illustrate, we have twice now

brought up the example of the uncertainty associated with the four inch dent, and we are going to have perhaps a range here that we are going to use that is 3 or 5, and I understand that this is purely exemplary that you threw this out.

But I think it exemplifies the problem that we are going to face, and that is a 25 percent range variation and deviation on either side, in terms of the four inch, and we are looking at 3 to 5, and you have got 25 percent on either side.

And I can assure you that the folks around this table that would be inclined to exercise cogitative dissonance and will focus on the 25 percent range, and what ultimately is 50 percent range of uncertainty in those estimates.

And that will have a dramatic effect of undermining any public confidence in this. So I just raise the question of what is the NRC's mission, and it is to protect public health and safety, and what is the link between instilling public confidence and garnering public health and safety.

I am not sure that these activity is something that is better vested with the cask manufacturers, the Department of Energy, transport companies. That's all I have to say.

FACILITATOR CAMERON: That is a lot of interesting food for thought there with respect to someone's overarching issues, but I think you might want to address some of the question now, Bill.

MR. BRACH: If I can. Your first reference to the mission of the agency is correct. Our primary mission is to protect public health and safety, and common defense and security, and the environment. And that is a legislative mandate to the NRC and that is our primary mission.

Your question relating to how is our meeting today, and how is our consideration of doing or carrying out the package performance study, the full scale testing of the cask related to our mission, and gaining if you will public confidence, go back to some of the earlier discussions.

And in some of the previous studies that the NRC has carried out, and comments that we have received with regard to if you will the NRC's lack or previous lack of involving the public in commenting on the process, and having input what we are doing, and how we are doing it, and how the results were analyzed, and from those results how we drew conclusions.

And I mentioned the package performance study, and what we are walking through right now, and we are trying to play a more active role with regard to engaging stakeholders, and a broad spectrum of stakeholders, whether it be State or local governments, Native American Indian organizations, or industry, and others, with regard to input to us.

And as to what types of tests, and what types of considerations should we consider in the tests. Our effort here, and clearly we have a technical objective, and that Ken and Andy have mentioned in earlier presentations, clearly of interest on our part is to gain and increase public confidence in what we are doing.

As was mentioned earlier, hopefully through an improved understanding of the tests we are planning, and through the various test parameters, and why those parameters would be selected, and how we are going to evaluate them, and have as much as we can an open and public process.

And as Andy has mentioned, to predict if in an impact test there will be an impact on the canister of some dimension. And I understand your comment with regard to the uncertainty and concerns that might come with understanding fully that uncertainty range.

The effort on our part in engaging the

public is to have a broader understanding, and not just the technical community within the NRC, and maybe the industry with regard to a technical basis for what we do, but a broader, and hopefully a broader understanding with our stakeholders, and a broader public participation and more general awareness of what we are doing and why we are doing it.

I mentioned this as a learning process, and one of the comments that I made earlier, too, was that this package performance study is our first effort on a major research project such as this to engage the public in our planning, and in our scoping, and helping us develop a test plan to be carried out.

And it is a learning process and we are looking for public input and we are hopeful that through that understanding that public confidence in what we are doing, and why we are doing it, and how the results are analyzed, and how we draw conclusions from those activities, will give the public a broader understanding.

And hopefully increase the confidence in the conclusions that we reach with regard to going back to our mission statement and as far as the actions that we are carrying out to ensure public health and safety. I am asking for your help in our achieving that overall objective.

FACILITATOR CAMERON: And, Mike.

MR. BAUGHMAN: I guess I would just suggest that I caution you about your expected outcome with regard to public confidence, and I would encourage perhaps some hypothesis testing on that potential outcome. I just question that as being a focus if you will of the mission of this particular activity.

FACILITATOR CAMERON: Okay. Thank you. Let's go to Judy, and then we ware going to go to the next segment of the program. Judy.

MS. TREICHEL: I have three questions and they would probably go faster if I just give them to you quickly. The first one is a follow-up on the first question that I asked, where you said that you would be testing a rail cask with an MPC.

Is it required that you have an MPC and could you test with one and then wind up using the cask without an MPC inside of it?

The second one is in regards to the impact limiters. That is a real descriptive term for what it is, and I don't think that your tests should include impact limiter, and I think it should include impact maximizing situations so that you are really getting a test of what it can do, because I am another one that is in favor of test failure, because it seems to me that if you test to a particular limit and it makes it as far as I am concerned one degree past that limit, it is failure.

So I think you should be as tough as you can with those. The very last one is I also believe that you should be testing every design that would be in use, and I back up Diane in the idea that you should be going back to looking at used casks.

They may have surprises for you, and the analogy I guess is that if you are just going to pick out one, and you are going to have a whole lot of cask designs, because there is a whole lot of vendors out there, would be -- it would seem to me that it would be like if I chose one of my children, and I gave them an SAT test and then that should just sort of cover the rest of them in college could take a look at that. So those are the three.

FACILITATOR CAMERON: Can someone -- this term impact limiter comes up a lot, and for those of us who don't really know this field, can someone give an explanation of what an impact limiter is, and I think that Judy has some questions as well.

DR. MURPHY: I will try to answer your questions, Judy. The first one about the rail cask with the MPC in it. I believe that we had indicated in earlier meetings that the NRC would be testing these packages as certified, and I believe -- and I will ask one of my colleagues here in SFPO to assure me that it is correct, that the certification for the Holtec Hi Star 100 includes the MPC.

So that is the reason that that is there, and so it is being testified as certified.

MS. TREICHEL: And you can't use it without one in there.

MR. BRACH: It might be worthwhile clarifying the reference to MPC, and one that is another acronym, and that stands for multipurpose canister, and in the discussion that we are having today, the MPC only relates to a canister that could be used in two different purposes, and that is for spent fuel storage, and spent fuel transportation.

The Holtec Hi Star 100 cask design includes the MPC, and the certification of that transport package for use includes the transportation overpack, and includes impact limiters in the contained MPC. The MPC is that part of the transport package that actually would be contained in this spent fuel in transport.

DR. MURPHY: To answer your second

question about the impact limiters, what an impact limiter is, is almost exactly what the word says. In particular, in the Holtec design, they are using a honeycomb aluminum material, and it has got a lot of holes in it, and I will call it aluminum walls.

So that as it impacts and crashes into something, the impact limiter performs and absorbs some of the energy so that less energy is then forced into the canister, or excuse me, into the cask itself.

One of the subquestions that you have got is the test to failure. Okay. At this stage, we are not proposing test to failure. We are proposing it to a particular classic deformation.

I am probably not going to be able to change your mind, but I am going to try. What we are driving at with the validation part of this test procedure is to come up with an understanding that our codes, and Sandia codes, can predict what happens to the cask.

And we will carry out the tests as proposed, and let's say it is 75 miles an hour, and Sandia will have done an excellent job of predicting what has happened, and we are all going to be happy that they can predict behavior.

Well, in our minds, the prediction is that they can tell you what is going to happen at 76, 77, and take it pretty close to an understanding of what is going to actually happen at whatever the failure speed would be.

So we are validating these codes -- and this is not going to make you happy -- so that we do not necessarily have to test every cask either to failure, or in this extra regulatory sense, so that we can take somebody else's cask, but maybe in the process of design today, we can do an analysis of that cask and over and beyond the certification regime, and tell you what is going to happen that one when it gets into this kind of situation as well.

So very definitely that is part of our process and where we are going with it. The test design is for every one, and I think I answered that question, that we are not looking to test every one. We are looking to have the certification process carried out, and where we have issues associated with how that cask will behave in the past certification regime, we will be able to use a code to look at that.

I liked your analogy about the SATs, because what we are doing is not doing an SAT for every cask, but we are designing a test procedure to look at it. So we are going one step further, and hat we are looking at a testing procedure if you want in the SAT analogy, rather than saying that we can tell by testing one student how the second student is going to behave.

And we are going to look at the testing procedure that if you apply that test to all of the students that we can have a good idea. Not an exact idea, and not a perfect idea, but an idea of how that cask is going to do in the extra regulatory situation.

MS. TREICHEL: Okay. Well, you can control your tests, but you are going to have to make a deal with god to control the accident, and so that is why we are talking about the test failure so that you really know what you are into. Thanks.

FACILITATOR CAMERON: Okay. And, Bob, we will pick you up on the way around. Let's give everyone a chance to just give us a short exposition of their interests or concerns on this, and let's start with the State of Utah. Diane.

MS. NIELSON: Thank you. I appreciate the comments, and this has been helpful in better understanding the intent. I guess just a couple of additional questions or comments to consider. If the public is going to understand and have confidence in what you are doing, they are going to have to understand not just what you are doing, or in other words what protocol you establish, but I think they are also are going to have to understand why you didn't do some of the other things that might have been considered, and why you didn't take recommendations, and why you didn't test every cask.

So it isn't just answering a set of questions or establishing a protocol for what you are doing, but it is also providing an explanation of why you are not doing some of those other things that might create a greater constance.

It would also be helpful to understand how you are going to draw conclusions from this protocol. You are establishing a protocol for what you are asking for input, and that means that we will understand the testing procedures, and considerations.

But there is not too much in this document right now as I see it about how you evaluate the results. Is there an envelope of performance that is acceptable and outside of that that would be unacceptable?

Is it a fail or not fail? Is the ultimate success that there isn't leakage? Those are some of the considerations that I think need to be in the test protocol, so that we understand the values of the conclusions that you are drawing and so that the public can understand them.

And then finally I think just a recognition that this is a point in time that you are looking at with a set of new casks, with a set of testing protocols, and we will learn things if this process moves forward, and the program moves forward for transportation.

And so not just urging that there be a protocol and an evaluation of an envelope of acceptance, or whatever in terms of how casks would be tested through time, but also how you are going to take that information and feed it back into the system to make sure that your ongoing test protocol is really addressing situations that we are going to deal with through time in the transportation sector.

FACILITATOR CAMERON: Okay. Thank you, Diane. Cash.

MR. JSASCZAK: Yes. One more time. Nye County, as you are well aware, is where it all ends up, assuming that is where the process ends up, and so we would like to laud the process that you are going through, in the sense that we want you to have the best kept process that you can have in place, because that is in our best interests.

We will wait to pass judgment on that, and see how it turns out, and make those judgments, since your mission obviously is to protect public health and safety. Somewhere in this process, you are going to have to make a risk benefit analysis of how far you go on any one of these aspects.

We understand that, and we accept that. We want you to make the best and probably the most conservative judgment that you can, knowing that each one of those conservative judgments has a dollar sign attached to it, and understanding that there are not unlimited resources available, and at some point you are going to have to make that judgment.

So we want you to make those best judgments, and we want to hope that they will withstand the scrutiny of both time and the unpredictability of nature, as only god can answer some of these questions, right?

FACILITATOR CAMERON: Okay. Thank you, Cash. Let's go to Jim Channell.

MR. CHANNELL: I have had -- I am an environmental engineer and a certified health physicist, and I have been involved for as I mentioned over 20 years with the transport of radioactive waste, and including TRUPACT-1, which was (inaudible), and the current TRUPACT-2, and also I have done a fair amount of modeling on probablistic risk of accidents and reviewed those by other people.

Because of the latter, I am really in favor of the general thrust of these extra regulatory tests because it will give us a couple of data points beyond which we don't have to use in refining our risk studies.

We have all assumed over the years that there would be releases at these more severe accidents, but we have had no very good basis to go on, on what these would be, and this should help.

The other place that I am coming from, the TRUPACT-2 was certified in 1989 by the NRC, but it was certified after extensive full-scale testing of the hypothetical accident tests.

And multiple 30 foot drops, and multiple puncture tests at different locations, and fire tests, and actually as a result of these, there were a couple of improvements made to the design of the TRUPACT in the process.

I observed a large number of these tests, and we interacted with the NRC and the contractor in the interim on these tests, and out of this came a great deal of confidence in myself and our organization, and I think the technical community, and

I believe that a large number of the governmental organizations around the west that are now receiving hundreds of shipments a year in this package (inaudible.)

What I am leading up to is a comment that I believe that all of these casks should be subject to the hypothetical accident condition test; the 30 foot drop, and the puncture test, and the fire test, and it is my understanding that few if any of these tests have been up to now, and I laud the recommendation that the structure panel had that these tests should first go through the hypothetical accident test, but they seem to limit it only to the impact test.

And I am also -- I believe that probably this would do more to gain confidence in the package to be certified than some other things, is the fact that if every one of them has to go through these basic full-scale tests.

And the other thing coupled with that is that I am a little bothered by a couple of references and a couple of references that have been said here this morning by NRC spokesmen that it is implied that regardless of the outcome of these tests that we are not going to revisit current certifications. And that is enough for right now. Thank you.

FACILITATOR CAMERON: Let's clarify that very important point is that a few minutes ago Andy Murphy, I thought I heard you say that if these tests show that we need to relook at the regulations or certifications, that we would do so, and is that the concern that you expressed, Jim? Did I capture that correctly?

MR. CHANNELL: Yes, that is basically correct. I really already think that all of them should have been anyway, but the second concern that I had, yes. And it should really be looked at.

FACILITATOR CAMERON: Okay. When we get to you, Bill, can you talk to that point, and let's go to Mike.

MR. BAUGHMAN: Thank you, and that last point that was just brought up by Jim and responded to by Mr. Brach is I think right on, and I appreciate that response. I would just note that I think we have a great deal of appreciation for the public process that is going through which we hope will result in an improved technical basis for the protocols.

And notwithstanding what I said previously about the value of all of this in terms of instilling public confidence, I do think that the public comments will result in better tests. And so I do appreciate this whole process.

FACILITATOR CAMERON: Thank you, Mike. Josie.

MS. LARSEN: I would like to reiterate what Mike just said. I appreciate being involved in the public process, and Nye County is a small county north of Las Vegas here, and it is an opportunity for us to kind of participate in the process, and help our constituents in ensuring their public health and safety.

And I would like to caution how you define your audience, because you are trying to instill public confidence and you have experts here, and the results are going to be conveyed in a different manner than if you were going to just the general public.

So I would encourage you to keep that in mind as this process moves along. Thank you.

FACILITATOR CAMERON: Thank you. Michael.

MR. CONROY: Thank you, and I also would like to thank the NRC for having these meetings, and inviting us to participate.

I wanted to bring up a couple of points that are stated in the test protocols report that the current regulations and programs for transporting spent nuclear fuel do result in a high degree of safety, and

NRC certification of spent fuel casks has contributed to an excellent safety record for transporting spent fuel.

And the safety protection provided by that current transportation regulatory system is well established. Over the past 50 years, there has been substantial experience gained in the transportation of spent fuel, and in the United States there have been over 2,700 shipments of spent fuel, and traveling over 1.6 million miles.

None of those shipments has resulted in the release of the radioactive contents. Similarly, thousands more of shipments have been made safely throughout the world. What we need to keep in mind is what the NRC staff is examining here is the adequacy of the analytical methods and data that are used to estimate the response of casks to improbable extreme accidents.

And that it is not the package performance study that is intended to involve the development of new standards for transportation casks, although it has been pointed out that there is that possibility.

But we anticipate that the tests described in the test protocols will demonstrate the validity of computational methods used to model the impact, and thermal response of Type E spent fuel transportation casks.

We would like the NRC to make clear that these tests are not proposed as new standards for package certification, per se, and we would also like to have them correlate the test conditions involving things like unyielding surfaces, to real world conditions of transport. Thank you.

FACILITATOR CAMERON: Okay. David, do you have a few words?

MR. ZABRANSKY: Yes, just to follow up on what Mike said. We also want to reiterate the department's commitment to supporting the cask performance program, and the NRC's efforts in this, and to encourage the stakeholders and the public to participate in the development of these protocols, because that is the only thing that can make these things helpful, and to instill confidence in the process.

FACILITATOR CAMERON: Okay. Thank you. Cindy.

MS. MARQUES: I am really new at this, and so I would like to thank you for inviting us. I have no comments right now, but I have learned a lot, and I think a lot of the comments that are being said, you guys really need to look into. And I will take this back to my tribal council, and then we will have comments by them as well for you. Thank you.

FACILITATOR CAMERON: Great. Thank you very much. Calvin.

MR. MEYERS: My name is Calvin Meyers, and I am a full-fledged Paiute, and this is actually some of my people's territory that you are on, and so you are welcome here. I don't think that I could ever trust you, because I can't trust anybody that won't come and teach me what they are talking about.

And I am not grateful that you invited to me, as I think you should have anyway. It is not something that should be automatic (inaudible) can't be here. My comments are -- and I am not a scientific person. I barely finished high school. I took a year UNLV and was bored to death.

But I do understand things, and one of the things that I do understand that you are doing tests for certified miles an hour, and the last time I was on the freeway, which was this morning, I was doing at least 85. And there were cars coming from everywhere, too.

And when you said that the environment is the last on the list of concerns, to me that is the first, because to me without the environment I wouldn't be able to live. Without the environment, my people would die.

One of the things that I wanted to say today was that it took 5 or 6 years before the NRC even acknowledged that they have a trust responsibility to the tribes.

To me, to fight for it for so long, and it took even longer to understand why you guys do what you do, because like was said here earlier, there are a lot of scientific people around this table, and what they do is they worry about their science, and they don't worry about what they are doing.

They don't worry about what they are doing to their own house. And when you tear your house apart and you don't have a place to live, and that is exactly what is going to happen if you don't really watch what you are doing.

We would like to let you know that it doesn't take an accident to have something like this come out, but what can happen is -- and this really reflects on my people, is that you can wipe out my whole government with just one truck.

I am talking about people that cannot be replaced, and you can have people replaced in Las Vegas because you have more people come in, but once you wipe out the Moapa Paiutes, they will no longer exist. You cannot import somebody else.

It does not matter how much it costs, how much it is worth, and let me ask Chip, how much is your life worth? And that is my point exactly.

FACILITATOR CAMERON: Is that a rhetorical question?

MR. MEYERS: And it is like that you don't understand the comment about being educated many times and it still has not happened (inaudible), and you have the trust and responsibility, and if you need to go back to your legal counsel and ask them what they are going to do about it.

And that rabbit that is running around out there, and that bush, and that plant, and those things that make us well, and that ground out there that helps us, and I have been places where I would never leave, because what happened is (inaudible) are there for a purpose.

I pray every time I go somewhere, and I do not pray to your god, but I pray to the man upstairs, the one that made everything, and the one that controls everything. He controls that car that I drive. He controls everything that happens in this universe. He controls the animals and the plants, and the earth, and if the earth is contaminated, then all of life is contaminated.

And those plants are dead and those animals are dead, and in my upbringing we were taught that (inaudible) at one time, and that's why I have to let you know that you have to put the environment first, because without the environment, the rest of us won't be here. Thank you.

FACILITATOR CAMERON: Okay. Thank you, Calvin. And the issues report that Calvin was talking about is this gold sheet that is back on the table for anybody who didn't get a copy of it.

And, Bonnie, I am going to give you this mike, because apparently that mike is not working real well.

MS. BOBB: Thank you. That is hard to follow up. That is really hard to follow up. I am not Shoshone. I am Shoshone by marriage to a Western Shoshone Spiritual Person. And whenever I read the reports, what was missing for me was some sort of human factor. It was very mechanistic. This is what will happen to the man-made objects.

And there was no concern with the people who are out there on the ground, like the tribe that I am from. There was no -- even concern for human health is not enunciated very well, but like I said, we are 12 miles from (inaudible), and I am not going to steal John Wells' thunder because I don't know that much about it, but the impact on the animals, and the impact on the ground.

My husband would tell you that to talk to the mountain and to look down from the tops of the mountains, and to be there, that landscape, that whole -- well, it is hard to explain. The BLM and the Forest Service comes to the tribe and they say will this have an impact on your cultural ways or your spiritual life, or whatever.

And they say, oh, we are not going to do that. We are going to do that right here, and they don't quite understand that that whole area is sacred, and they don't quite understand that what you do to that over here affects what I am doing and thinking of here.

And to think of my husband on top of the mountain praying and looking down upon this railway or these trucks, or a combination of both, is kind of like I hope that he is praying really well. But I think that will take away some of the spirituality, and I don't think that can be replaced.

I am interested still in finding out the hard questions, because we ask what risk is acceptable, and how would you get to us, and who are the people that are qualified to be on the scene, and where is the money going to come from to give the education and the training, and the equipment for the people who have to be immediately on the scene so that all of the Shoshone people don't die.

And what about the plants, and what about the animals, and what is going to happen to the environment, and what water are we going to drink. So I need to know what kind of probability it refers to, and in most cases, what is mostly safe. And what is mostly safe?

What is mostly safe? I want to know what the acceptable limits. I want to know what is acceptable, and what level of life is acceptable to remain. What level of accidents are you willing to accept. I want to know what the mortality estimates are if there is an accident.

If there is the worse case scenario, what is going to happen, and what will the mortality rate be, and will happen to the water. And in commenting on Ms. Larson's comments, whenever I read these documents, I wonder why I am sitting here and not a Shoshone person.

And it is because Shoshone people who have come to attend this meeting can't quite understand some of the jargon and some of the science that is in here about distributions, and I said, well, maybe I can, but it is not making any sense to me either. It is like whenever the documents are written -- and I know that it is very difficult to write something that makes sense to all people, but the tribe is not the public, and the nation is not the public.

We should be addressed, and when I say we loosely, we should have been addressed first and that never happened. If you come to us and we don't understand you, it should be explained. That is part of the consultation process.

Whenever I read these documents, they are quite too complex for a normal person in our society, and the questions that you are asking are probably beyond a lot of people's capabilities. I don't know how many miles per hour is acceptable, and how many tests are acceptable and that there should be.

But as a scientist, I look at it and there is not enough information, and so essentially this document tells me that there is too much for some people and not enough for others. I want more. I want more of the science in here, and I want to know the numbers, and I want to be able to make a decision for myself, and I think the rest of the people do, too.

I also think that there should be -- and the reason that I asked about the consultants, is that a lot of the questions that you are expecting us to answer should be answered by people who hold an opposite view, but who are experts in their field.

They will be the ones who could ask the good questions and proceed to interrogate you when you come back with an answer, because I think that is what we want, because I think that we want life to continue.

FACILITATOR CAMERON: Thank you, Bonnie, and I want to emphasize Calvin's point about the importance of education.

MR. WELLS: Well, following Calvin and Bonnie, I think we can all go home now. I have been following these meetings, and I have been boring Federal, State and County officials with the same statement time after time, and I will make it quick and sweet. You have no more authority to transport or store nuclear waste at Yucca Mountain than you do to take it to the Yukon Territories. It does not belong to you.

It is within the borders of the Western Shoshone Nation, and we have no intent to secede our territory so that you can further poison mother earth with this material. There is not much more to be said about that.

I just made a few notes on some points that have come up, and the discussion is, one, public confidence. I listened to a gentleman talk for a few minutes and I didn't time it, on an impact limiter.

If you want public confidence, you need to speak the way the public can understand, and an impact limiter is a shock absorber. It's simple. Half a second and its out.

I have looked through some of this material, and from what I see your tests are limited to impact and fire. I see no reference to attack by small arms fire, explosives, or attack by aircraft crash. The public wants to know that.

And if you don't take one of those canisters out and lay at it with an M-16 armed with armor piercing shells, no one is going to believe anything that you have to say. You do not want to test to a failure, and you go to a point and then you predict.

Predictions are theoretical, and let's put in the way that people speak. It is just your best educated guess. But it is a guess. The public doesn't care what the canisters can do. The public will want to know what they can't do. Thank you.

FACILITATOR CAMERON: Okay. Thank you very much, John. Let's go to Jim.

MR. PEGUES: Well, first of all, I would just like to say that for the record the City of Las Vegas strongly opposes the Yucca Mountain project. However, since we find ourselves in the situation that we are today, I would must like to first of all thank the NRC for having this forum today, because I think it was very valuable to be able to have this discussion, both pro and con, on the situation.

As part of my specific comments, I would just like to encourage the NRC to test all of the casks. I know that Judy mentioned the analogy about how you test students, and I would just like to say that using a miliary model, you can't use the parameters for a B-1 bomber to decide how a B-2 bomber will perform.

I also would like to recommend that you test to failure, because I believe that we need to know exactly what the abilities of the casks are, and just to test in the laboratory, or use modeling, or just test to a certain point, I don't believe that you have looked at the answers that we really need to make an informed decision.

And lastly I hope that the comments that are derived here today are handled a lot differently than what we have perceived the comments were handled by the DOE in regards to the final EIS.

And I would just like ask you to take our comments back, and it has been brought up by several other people here in the room, and to make sure that they are integrated properly so that we can have the best outcome. Thanks.

FACILITATOR CAMERON: Okay. Thanks, Jim, and hopefully we will get to defining what test to failure means this afternoon. Kalynda.

MS. TILGES: Kalynda Tilges, Shundahai Network executive director. I have a couple of statements to read, and I also have a question. First of all, I have a question.

When I was invited to this event, I was told that there would be time for public comment and that this was a public workshop. I see very little public. I see very little room for public, and also on the agenda, I see no room for public comment, and I would like to find out what is going on with that.

Secondly, I would like to make a comment about the unmoving surface. I am not sure what happens to the earth by using an unyielding surface seems to me like smoking mirrors.

I believe that the public needs the reality of different types of surfaces. What is going to happen if a cask drops and lodges into the cement and asphalt of a freeway. What happens when you try and drag it out. I think that would be very telling.

I think you need to explain to the public about unyielding surfaces. I am not against using it, but it should be in conjunction with real life surfaces, and not a stand alone test.

With that said, I am going to go on and read a statement from the Shundahai Network about these whole proceedings, and what I am going to say here and more up on the table in talking points, "Too little Too Late."

And also in grass roots organizations in New Mexico, who have been living with radioactive transportation shipments in every day life for quite a while now have sent us a letter outlining their experience with what has happened with their shipments, and how whatever is decided will continue to degrade after it has been decided.

So with that said, I am going to read what Shundahai has to say about all of this. The Nuclear

Regulatory Commission has issued a draft report for public comment on the standard for testing high level radioactive waste transportation casks.

They said that public opinion is important to them. The NRC says that it really wants public input in what they propose to do. If this is true, why would they plan the public workshop for a weekday when most people are at work or at school.

If the NRC really does care about public confidence and the safety of the American public, which should come first, why does the draft report state in more than one place in the executive summary alone that they do not intend to develop new standards for cask testing, but the agency's current regulations are as adequate as they need to be, and that this report does not employ any commitment on the part of the NRC to conduct any of these tests.

The Shundahai Network feels that the NRC should make full-scale testing to failure a licensing requirement for every cask design. The NRC now is suggesting just two casks to extra regulatory full-scale physical testing.

At the very least the agency should test every cask design proposed for shipments to Yucca Mountain private fuel storage projects. The NRC proposes only fire and crash tests. The testing regime should be expanded to include puncture, crushing force, and deep emersion tests.

The proposed tests will not evaluate cask vulnerability to an attack of any kind. The NRC should expand the testing regime to include the explosive and missile attacks, and the NRC should test full-scale tasks, and not just scale models.

They should also test casks to failure and not arbitrary standards. The Shundahai Network expects reevaluation of the NRC cask performance standards with meaningful, and I will repeat, with meaningful stakeholder participation.

And again meaningful stakeholder participation from all affected areas for all proposed routes, including Salt Lake City, which is important, and that has been missed; the development of testing protocols, selection of test facilities, and personnel.

Full-scale testing to failure of all casks prior to NRC certification, and this would include every cask model used or proposed to be used; casks selected at random; in very rural accident and attack situations; testing all possible shipping scenarios -- train, truck, barge, et cetera, whatever you manage to come up with.

Complete openness and transparency of every step in this process, including costs, and media and public oversight of all tests. Thank you very much.

FACILITATOR CAMERON: Okay. Thank you, Kalynda. We will be going out to all of you before we break for lunch, which will probably be about four o'clock.

(Laughter.)

FACILITATOR CAMERON: But we will get through this and then we will break for lunch. And if the NRC folks want to add anything important. Go ahead, Bill.

MR. BRACH: I just wanted to add one comment, Chip. Earlier, Jim had raised a question with regard to the NRC's planned use if you will of the results of the package performance study test. I want to try to clarify two aspects.

One, in the opening comments I had mentioned and had summarized as well, that the NRC believes that our current rules and our current regulations, and our current criteria for tests and certification of transportation casks are adequate.

And that is our belief and support of existing regulations, criteria, and standards. I want to clearly clarify that this comment from my experience, and I have worked in different parts of the NRC over my career, whether it be in transportation or in other regulatory activities, clearly if we conduct a study, and if there is an operational event, or information comes to the NRC that would cause us to step back and relook at our current processes, our current standards, and current approach, and question the adequacy, we do that.

And so in particular to your earlier comment, Jim. If from the package performance study test there is information that we learn from the results of the activities that cause us to relook at our standards, we clearly will and will do that.

FACILITATOR CAMERON: Okay. Thank you. Andy, did you want to make a comment?

DR. MURPHY: I wanted to say one sentence, I guess. And that was initially a comment that Judy made sort of implied that this was some sort of a support for the Yucca Mountain program.

The package performance study is being done for transportation in general. It does not imply some sort of an NRC endorsement of the Yucca Mountain project.

This is being done for transportation, and if there was not a Yucca Mountain, you are talking about moving this stuff around, and this would be part of our program to understand how to best move this stuff, to move spent nuclear fuel around safely.

FACILITATOR CAMERON: Okay. Thank you, Andy. Ken, did you have anything?

MR. SORENSON: No.

FACILITATOR CAMERON: Let's go to John Kessler.

MR. KESSLER: We also have high confidence in the existing regulations to protect the health and safety of the public. We think that the tests that are required in the current regulations are really quite severe, and we are also confident that the way that cask designers need to go through a certification process, including testing and maintenance of those casks, further ensures a large margin of safety on top of those requirements.

Having said that, if PPS is going to proceed, and go into what is extra regulatory, and by nature extra regulatory means it is not necessarily tied to the regulations, although certainly a review of regulations is possible as is anything else, then one has to ask what is your purpose.

And there is two purposes, and one is to validate certain models, and you talked about plastic deformation, which again trying to use more common lingo, plastic deformation is to imagine a piece of clay dropping on the floor, and it just kind of spreads out and deforms, and changes shape. That is plastic deformation.

I believe that is currently what the test protocol is supposed to get to, and what we expect in 99.99 -- and however many nines that you like -- percent of most accidents, is what is called elastic deformation.

Drop a spring on the ground and it comes back to the same shape that you had it, and models are developed for that are what we feel are adequate for the vast majority of cases.

Now, testing to failure. First of all, what is failure, and we have not really discussed that, and hopefully we will get to that later on. And reading the test protocols, failing the cask with the MPC inside, which is in NRC's view as well the primary barrier, is not failure in my opinion.

Failure is something that might initiate release and of course you have to look at release and what are the consequences, and you get into a lot of subjective input there, which is probably one of the reasons why we are having this meeting.

So I think we need to have that clarified on what failure is. I guess my concern about tests and doing testing out to these extra regulatory regions is -- you know, this idea that you are going -- you can always create a set of conditions to fail a cask.

And what relevance do those have to real world conditions is something that the NRC needs to address and put in context for us. Our belief is looking at some of that probability information in Appendix A, certainly you are making conservative assumptions there.

And we feel that the likelihood of the conditions leading to failure is very, very low, as it should be. One then has to weigh the cost of going to a certain kind of test to get test data, versus trying to address testing failure.

Personally, I don't understand what it is that we are getting out of going to failure. You know, what is the purpose of testing to failure. If you want to see where the edge is, fine, but don't start with the failure test if you are going to talk about a $20 million program.

I also endorse that if you are going to do this, take the structural committee's recommendations and start with your regulatory criteria testing. That way you are likely to be able to salvage the same container and get some more testing out of it and have a more cost effective approach, and that way you actually can get some idea of where your failure point is, as well as perhaps bolstering a bit more confidence in the casks at the current regulatory criteria. Thank you.

FACILITATOR CAMERON: Thank you very much, and we will go to some of those questions when we get to that. Judy.

MS. TREICHEL: I wanted to back up what Jim Pegues said about these comments making a difference and being taken into consideration. We went through a long and torturous process, and we all commented at great length on Part 63 having to do with Yucca Mountain, and believe that we were robbed because we didn't see any of the really great comments carry on through, and we also didn't see why not.

And so as Diane has said, I think you need to tell us why you didn't do some of the things that were here, and think very seriously about taking this to heart with what you are hearing. There are a lot of people here, and some of whom are losing a day's pay in order to be here, and they do this for the right reasons.

And the NRC needs to make a far better showing on these comments than they did previously. The other thing that I think needs to be checked out as far as tests are concerned is the terrorism thing.

And I am not throwing that up like a red herring. It is there, and as we just saw with PFS, the Air Force factor is a major one when it comes to Yucca Mountain.

If you are looking at that, and it comes along whenever you are transporting anywhere near a military operation, there are jets flying around and one could hit a cask.

And a cask could be the subject of sabotage. I was sent a book and I am reading it for review right now, in which it is probably going to be a best seller, and it is about a shipment of high level waste being captured.

And so this is on people's minds, and within the last 18 months, people in the United States have been subjected to things that could never have happened.

If it had been up the NRC to run the tables on the possibilities of some of the things that have happened to the United States citizens just starting from 9/11 and coming forward with anthrax, and the sniper, and the Columbia falling out of the sky, and a few other things, these would have been ruled out, and screened out because of the lack of probability.

So people in this country have become less confident in general, and you are going to have to do a lot, and you are going to have to get over the idea that by looking at what happened before, or by estimating what can happen, we can be really wrong.

And you are an agency that is paid for by the people that are here to serve the people, and that has to happen, and you have to serve the people, and you have to take these things into consideration and consider these comments. Thank you.

FACILITATOR CAMERON: Thank you, Judy. Let's go to Peggy.

MS. JOHNSON: My name is Peggy Maze Johnson, and I am representing Citizen Alert. Citizen Alert started 27 years ago in this state because they were talking about bringing nuclear waste to the State of Nevada.

I guess I start out always with my mantra, which I am not a scientist, and I am not a transportation expert. But what I bring to my job is

30 years of politics, and all I have seen so far in my short tenure with Citizen Alert are decisions made by politics.

I have spent a lot of time in politics and I have spent a lot of time working in government, and it pains me to ask the question do I trust my government, and it pains me even more to say, no, I don't.

I believe that we need to do everything to make sure that the public understands and feels safe with the process that you are all going through. Mr. Murphy said, Judy, this is not going to make you happy, and yet every other word that comes out of your mouth is public confidence.

You know, to me that sounds like a public relations campaign, and that is what it has felt like since I got involved in this issue. I sat down with Margaret Chu (phonetic) and some of her people from DOE and I walked out, and all of a sudden there was this flash in my brain.

And what I saw were all those tobacco executives sitting at the table in front of Congress and saying, oh, no, this doesn't kill. Oh, no, this won't cause cancer. Oh, no, this won't hurt you.

You need to do more than have an ad

campaign. You must -- you absolutely must make this if you intend to do it, as safe as you can do it. I guess I am appalled that we are sitting here 50 years maybe or even longer too late.

Why were not all these questions asked when we were putting up nuclear power plants and when we were creating nuclear waste? Why are we looking at it now when maybe it is too late to make any of us safe.

And that just absolutely outrages me. I am not going to be here that much longer, but I have children and I have grandchildren, who will have children and who will have grandchildren.

And I think you have to understand the absolute monumental decisions that you have facing you, and I just have the feeling that you are all so glib about it, and I don't think you even get what it is.

You know, you talk about computer modeling. I am one of those people that is still trying to figure out to get those little figures across the television and into the television screen.

How are you going to explain computer modeling to the people that are sitting out on these transportation routes? These proposed routes go through 43 States, between 6 and 700 counties, and over a hundred-million people are going to be exposed to this waste that you all are in charge of transporting safely. Please do your job well.

FACILITATOR CAMERON: Thank you, Peggy. Fred.

MR. DILGER: Good afternoon. I am Fred Dilger, here representing Clark County. First, I want to thank the NRC for having these hearings here. We appreciate the opportunity to comment, as well as the point in which and the process in which we are commenting here.

Everything that I am told and have been able to learn is that the NRC is genuinely interested in our input, and that we have a real opportunity here to shape this program for the better.

With that said, I am passing out the counter-proposal for cask testing. This was prepared by the State of Nevada and Clark County jointly, and we are calling for full-scale regulatory testing of the regulatory tests. That is what we want to see.

We believe that there are issues associated with that that we need to talk about today, and testing to failure and the marginal costs to the additional tests, and of course when we talk about failure, we have to define failure.

Is it a loss of shielding, or a loss of containment, but those are technical issues that we can talk about and you will get input on. But we do believe that the changed security environment, as well as the problems associated with computer validation and computer modeling, pretty much demand full-scale cask testing.

One thing which I need to address, and I need to address this comment to the NRC staff here, because last week you heard someone representing a Northeastern State describe how comfortable they were with the existing modeling process and procedures.

And I just have to say that although these proceedings are not aimed at Yucca Mountain, nor at the PFS facility, the overwhelming numbers of shipments that will take place in the future in the United States over the next 50 years will ultimately either be to Yucca Mountain or to the Gasuhu (phonetic) facility given what we know today.

And something like 75 percent of those shipment miles will occur west of the Mississippi River. So from a Western perspective, or from a perspective out here, this is a Western kind of problem, and we are the ones who are going to be bearing a great deal of the brunt of this issue.

And that relates to the cost issue. Mike Baughman raised it a little bit, and hopefully we will be able to talk a little bit more about it this afternoon.

But when seen in the perspective of the other programs that are out there on the table, the WIPP program, the Yucca Mountain program, the private field storage program, and even a Cadillac, a Rolls-Royce testing program is not that expensive.

I do need to echo Bob Halstead's comments about 6672, and Clark County was the only local government to actually pay a contractor to do evaluate 6672, and we thought it was extremely deficient.

We do not think that the issues report addressed those deficiencies adequately, and when we were down in Waste Management recently, we saw the 6672 risk analysis enshrined into some of the Department of Energy's computer models.

So we have already seen a two-thirds reduction in risk thanks to the use of that report that is now being hard-wired into the Department of Energy system, and that is very disturbing.

The last thing I want to say is that I believe -- and we have heard it around this table before, and I said it last week in Washington, and I will say it again, and that is that I think that the NRC's primary mission of public safety is a laudable one, and I think that is what you should seek to test.

I do not think that public confidence is something that you can test to. I think you can achieve -- we need to focus on public safety and anticipate that public confidence will flow from that.

I think that confidence testing is not useful, and I think it is putting the cart before the horse. Let's get the safety right, and then the confidence will come out of that. Thank you.

FACILITATOR CAMERON: Okay. Thanks, Fred, and we will see if we can get some extra copies of the paper for everyone before everyone comes back from lunch. Bob.

MR. HALSTEAD: Bob Halstead, State of Nevada, Agency for Nuclear Projects. We think that cask testing is possibly the single most important nuclear waste transportation safety issue, and it is one of the reasons why Nevada has spent a great deal of energy over the past 15 years refining our proposals and studying the costs.

And we are really appreciative of the NRC's approach here, and it may not sound that way, because there are many things that frankly we do not agree with the NRC on, and we are not going to hold any punches back.

On the other hand, on this particular proceeding, I take them at their word, and I say this especially to Bill, who over the years has had to take the brunt of many arguments with me. I believe that Bill is a person of integrity and when he tells me that he has told his staff that everything that they put on the table in this report is open is open.

I believe that, and I think that we have to give them the benefit of the doubt, all of us, and give them our best recommendations. Obviously different stakeholders are going to make different recommendations. The State of Nevada has a proposal for both regulatory testing -- and that is testing to see if the casks actually meet the safety standards in the regulations.

Plus, a combination of full-scale testing, computer simulations, scale models, and component testing, to get at that issue of where are the failure thresholds, and can we feed that back into our regulatory analysis and see if our standards are adequate.

We are developing a more detailed proposal where we are going to try and take the NRC's approach and combine it with our approach, and unfortunately we have not had enough time to do that yet.

But I suspect that we will have a very detailed proposal by May 30th. I wanted to stress two points here other than the importance of public participation and stakeholder participation.

First, the tests really have to be focused on public safety. Any public confidence that comes about is laudable, but the goal is safety. And secondary costs matters. Now, I have to applaud you, Mike Baughman, for getting Andy to put a cost number out.

I tried to interrogate him on this last week and he wouldn't give a cost number. Now, we have been studying these costs for 15 years, and we know that the TRUPACT test cost about $5 million back in the late '80s.

We know that the British tests that you see in Operation Smash Hit cost about $8 million in the early '80s for both regulatory and demonstration testing.

We made an estimate on our own that their program would cost 20-to-30 million dollars, and so I think when Andy says more than 20 that we are still in the same ball park.

We think that it is 20-to-30 million dollars for testing two kits. We have got a detailed cost proposal in our paper, and man, we have excessive public participation costs to add in there, and we have hostile peer review in there, and we have lots of contingencies, because I think that these technical details, like installation of heaters, and the difference between dummy and surrogate fuel, I think it is going to be extremely difficult to instrument and record the data from these tests.

And so it is possible tha we have overstated those costs. We think that you can do a really comprehensive testing program of the 5-to-8 casks that would be used for Yucca Mountain with or without a PFS facility in there for somewhere in the range of 50-to-70 million dollars.

And I ask you to consider this. The costs are paid by the rate payers primarily, and a small part for defense activities comes from taxes, but mostly it is the people who benefit from electricity from nuclear power plants that are going to pay for this through the Nuclear Waste Plan.

The repositories are estimated to cost about $60 billion, give or take $10 billion, and maybe that is a low number, but we will live with it for now.

And the transportation costs, the State is estimating about $9 billion. So a really comprehensive testing program that does regulatory testing and testing to fail, regulatory testing for all of the casks, and for some sample of them and finding out where the failure threshold is, costs less than one percent of the transportation component out the repository program.

So I ask you to consider that as a basis of reasonability when we throw these different testing proposals on the table this afternoon, and I look forward to that. Thank you very much.

FACILITATOR CAMERON: Thank you and let's go to Rick Boyle.

MR. BOYLE: Thank you. I am Rick Boyle and I work with the U.S. Department of Transportation. I work in the office where we regulate all hazardous material transport in the U.S., and that is all nine hazard classes; where one class is radioactive material.

We are interested, as the NRC is, in improving our program and improving the safety of our program, and that is why we are here today, is to learn lessons from here, and to look at this program and to make sure that the planning and the execution of the program is valid.

And then when it is completed, to take the results and to look at how they affect our overall HAZMAT program, and how we can use the results to make all of HAZMAT transport safety better. Thank you.

FACILITATOR CAMERON: Okay. Thank you very much, Rick. Let's go to Tom.

MR. DANNER: Good afternoon. My name is Tom Danner, and I am with NAC International, and I represent the design faction of providing packages to the industry. I believe that the regulatory criteria that we currently have in place definitely does provide us a safe industry.

The analysis that we have been doing is I think supporting and represent the methodology that we have in place, is going to be validated through this testing program.

We have done it before, and in terms of needing to go ahead and test a full-sized cask , I believe is in support of public confidence. The technology has been around in the industry, and we verify all our methods in great detail.

We have gone through testing programs that have validated these methods to be acceptable in showing that we can meet the criteria that we apply in the industry. So I believe that what we are trying to do here really now has established the public confidence in what we have in place as a safe system.

The testing that we have done have gone ahead and overtested the systems that we have in place. I have gone ahead and tested systems in excess of 6, 7, and 8 times of what the criteria and the design safety limits were for these packages, and they have performed very, very well.

This is outside of course of the licensing aspects or programs that we were trying to put in place. So I have a high confidence level in what we have on the roads and as well as the criteria that we have in place.

So I see that the whole program has really been focusing on public confidence, and we need to satisfy that. That is basically our responsibility.

FACILITATOR CAMERON: Amy.

MS. SNYDER: Yes. I would like to say that the NRC has high confidence in our current regulations, and we believe that those cask certification requirements ensure the public health and safety, and the environment, and we would like your comments as far as our draft test protocol, and when we consider your comments and your rationale of why you feel the way that you do.

And we will consider all of your comments. We plan on putting out and developing a detailed plan or procedures if you will for test protocols, and we will address the fact of what comments we have incorporated, and why, and what comments we have not.

We have not decided how we are going to do that, but that is very important. We want your comments, and specifically this testing to failure, and also the success of the tests, and what would constitute success of the tests.

So these are very important questions and again nothing has been decided, and we appreciate your participation in this workshop.

FACILITATOR CAMERON: Okay. Thank you very much, Amy. Obviously we are behind, but I think we have a good foundation, and perhaps during the lunch hour we could spell out some specific issues for discussion so that we can move through that really efficiently.

And how about all of you out here? Thank you for sitting patiently. Does anyone want to make a comment or ask a question? And we will go back out this afternoon. Yes, sir?

MR. CARR: Yes, the last time I spoke to

somebody -- my name is Jay Carr, and I am not affiliated with any organization. The last time I spoke with the Yucca Mountain scientists, I came down to ask you about climate change, and my confidence was shaken when they told me that they had projected analyses which contradicted the existing scientific information about when is the best (inaudible).

And it seems to me that eventually these casks could be under water, and there is a good chance, and I am curious as to what might happen. Mr. Sorenson might know or he might not, because they told me that they got the projected analysis from Europe. So you might not. What might happen if the integrity of the casks are compromised by water?

FACILITATOR CAMERON: Thank you. Ken.

MR. SORENSON: Well, as you probably know, the protocols do not cover emersion, and that is one of the things that we talked about last week, and I know that Bob Halstead mentioned that with the barge shipments, particularly in the Great Lakes, because it is projected that there are going to be a fair amount of shipments on barges.

From a technical standpoint for that type of emersion, at least in near term, we don't see an issue in terms of losing containment of the material from emersion.

That said, if you had Yucca Mountain under water for a long period of time, there could be other issues in terms of corrosion and things like that. Clearly that is not being covered in this particular project.

FACILITATOR CAMERON: Okay. And thank you, Ted, for that comment. Others?

MS. CUE: My name is Lisa Cue, and I am here representing the Public Citizen, and we are a national non-profit public interest organization based in Washington, D.C. We have a longstanding concern with the safety of transporting high level nuclear waste, and to that end we oppose shipments to Yucca Mountain, and we advocate stronger regulation for nuclear waste transportation in general.

I just wanted to add one issue that has been touched upon here, and that is the cost. I guess from our standpoint at this point that the draft proposal for the package performance study does not go nearly far enough to address our concerns. And costs have been mentioned by the NRC's presentations today as a limiting factor there.

And so I think or I would certainly not want to suggest that costs be the dominant factor, or be offered as a trade-off for public safety concerns, but I think if it is being offered as a limiting factor, we do need to know what is the cost projected for these studies, and moreover what would be the marginal cost increase for performing additional tests once the infrastructure was already paid for.

And the second issue related to costs that I wanted to raise is how is it being budgeted? I think it would be very helpful to know whether in fact from a budget perspective the package performance study is a Yucca Mountain project.

Is this being budgeted out of the funds that are normally directed to the Yucca Mountain project, or is it being budgeted under the Nuclear Regulatory Commission's general cost recovery appropriations. Thank you.

FACILITATOR CAMERON: Thank you, Lisa. Bill, can you answer that last question about where these funds for this study come from?

MR. BRACH: Starting in the next fiscal year the funds for the package performance study would be coming from the Nuclear Waste Fund, and I think that Bob Halstead was characterizing before correctly, the source of the nuclear waste funds, and how those are derived.

One aspect that I want to mention with regard to costs. Amy, beforehand, mentioned a general ball park if you will for our estimate on the conduct of the package performance study and the tests. A concern that I have is that clearly cost funds need to be available and provided for us to carry the study and the tests out.

A concern that I have is that the purpose of what we are trying to do right now is to identify what types of tests, and what numbers of tests, and what types of casks, numbers of casks, and what condition should be considered in the testing.

And I would ask that I would like to keep a focus on the testing, and the conditions, and the parameters to help us focus. We need to be doing the right tests and the best tests, and at this point in time I think the focus on the types of tests, and the conditions of the tests.

And the purpose of our study and our activity right now are to try to identify what we should be carrying out. Clearly, once we get beyond that point and we are going to implement and proceed forward, having funds available and the costs are going to be a really important factor.

In the approaches right now, I think I

would like to have our focus on what tests should we carry out, and what types of casks, and the draft test protocols have identified cask impact and fire tests, and clearly today, and in the performance study meeting that we had last week, there were suggestions as well of doing emersion tests, and puncture tests, and torch tests, and other types of tests, to be considered.

And I think what we need to do now is to dix on what types of tests, and conditions of the tests, and then we would have to factor in the costs as we are proceeding.

But I would like to right now to try to keep a focus on what is it that we should be doing in considering these full-scale tests.

FACILITATOR CAMERON: Okay. And, Lisa, did that clarification about where the funds come from alleviate the concern that was behind your question? I wasn't sure if it did or not, but I thought that I would check.

MS. GUE: I appreciate the clarification. It focuses my concern rather than alleviating it.

FACILITATOR CAMERON: Well, at least we accomplished something. All right. Anybody else have a question or a comment before we go to lunch? John.

MR. HADDER: Hello. My name is John

Hadder, and I am the Northern Nevada Coordinator for Citizen Alert, and if you really want to know an impact limiter is, look outside. Citizen Alert's model of a waste cask is sitting out there, and today it is really the closest thing that we have to the GA-4 design. All the rest of them are on paper.

I do appreciate the NRC doing this process. I think it is very important and I underscore, and I think that Citizen Alert stands behind the comments of Bob Halstead and particularly a lot of others here -- Calvin Meyers and all of the other comments that people have made are very important to our public process.

And there are things that I would like to raise and I think one thing is that we hear over and over again at the very beginning was about how this process is not designed to examine the existing regulations that are believed to be just fine.

And I think that is important in terms of when you conduct any kind of an analysis, especially a scientific one, and do you go in with a challenging perspective, or do you go in with a perspective that you already believe, and that the answer that you want to get is what you are going to achieve.

When I looked at the documentation that

came out for this package performance study, and the modeling criteria to set up what kind of tests are going to be done, and the question that came to me is it looks like, or at least the conclusion that I began to reach was it looks like we are trying to figure out what answer we want to get so that we can ask the right question.

And I really would like to say that that is not the way good science ought to work, at least in my experience in the science community is not to do it that way.

And it is not a way in which it is going to instill confidence or safety, which I think is more important. I think that Fred's point is very important. It should be about safety, and confidence will follow from that.

And so I really would like to underscore the bias, the potential bias that might be going into this testing program, and that we really ought to be clear about what we are trying to achieve.

I think it is really important that we challenge, always challenge what we have out there, and so we can find the parameters, the limits, of safety. It is absolutely important.

And I would like to also underscore that I think that the reason that we need to go way out of our way in this particular case is because the nature of the hazard is extreme.

We are not talking about bubble gum here, and we all know that. But is hard for the average person, it is hard to understand the level of radioactivity that exists in these materials, and that is why we have to be extremely, extremely careful, and extremely, extremely safe.

So I would like to underscore that part of it. I would also like to note that there was a comment made earlier about reasonable expectation of use. I think it is vital that whatever tests are done may be done on containers that either are in use or definitely will be in use. Let's be real clear about that.

This program -- and it is good that the public process is happening now, but in terms of the testing, it may be a little bit -- to some extent it may be premature until we know exactly what we are going to be using.

Certainly it is a waste of resources to go through a testing procedure and that cask does not end up being used very much. Like I said, the GA-4 is a good example. I mean, it is all on paper.

It has been licensed and everything and it is all on paper. Is it really going to be used for Yucca Mountain, or is it going to be used later, and is it going to be used for transportation?

I think we really need to be clear that we are testing the right thing here as testing goes. Certainly Citizen Alert supports test to failure, of course, naturally, and we need to know the parameters of what you are dealing with.

To me, I don't understand why people don't understand that. It seems pretty straightforward. And there was also a question about how long should the fire test be. Until it fails. It is very simple, and the same answer, and the same question, and until it breaches.

And I don't think that this will undermine the confidence issue. What it is showing is that the NRC wants to find out the answers. Like John Wells pointed out, the public wants to know what it won't do.

When you are building a bridge, you want to know what it won't do. You don't want the trucks falling into the river, and you don't want people falling into the river. That is just good engineering, right? So I have made that point.

And again I do appreciate the opportunity to be here, and I think that I also would like to underscore Calvin's point about trust and it is very important to go to the communities and do the education, and be part of helping the public to understand all aspects of what we are proposing here, and that is all that I have for right now. Thank you.

FACILITATOR CAMERON: Thanks, John, and I want to thank all of you, and let's break for lunch, and we will try to get more copies of the Halstead-Dilger paper for everybody.

(Whereupon, a luncheon recess was taken at 1:17 p.m.)

A F T E R N O O N   S E S S I O N

(2:51 p.m.)

FACILITATOR CAMERON: Okay. We will have specific issues to discuss and we can get peoples' reactions to that, and perhaps move through this pretty efficiently.

I think that we needed to spend the time that we did this morning to establish a foundation, but I think we might be able to move more quickly. The first thing we are going to do is talk about these overarching issues category.

And I will go through the details on that in a minute. Secondly, there is the general testing issues discussion, and I think that probably will move quickly.

We heard a lot of that already this morning, in terms of the types of casks that should be used, and Diane Nielson talked about we should use used casks, and other people said to make sure that you do the full-scale testing on any that might be employed in shipping.

There was a further suggestion that any cask that comes in for certification should go through a full-scale testing. And then under those general testing issues, I guess the type of tests might apply there. We heard emersion, puncture, air crash, terrorism.

After we are done with the general testing issues, we have the fire issues, and Amy Snyder, who I will introduce at that time, is going to tee it up for us, and then we have Chris Bajwa, who is going to talk about the Baltimore Tunnel Fire.

And then we will go to impact testing, and then we will see what else there is. I think we are covering most of the issues that we had in the parking lot.

There are two remaining that we have not talked about, and we might want to do that at some point. One is this relationship of the NUREG CR 6672 to the draft protocol. There may not be any relationship. I don't know.

But it was a controversial issue this morning, and so if we can address that. And then the second one, several people asked me what is the time frame for this program, and how do you imagine that all being laid out, and in terms of overarching issues, and this is my best stab at it, but there are a lot of good issues raised, and this does not necessarily have everything on it.

But there were a lot of questions about

what is the NRC trying to accomplish with this plan, or perhaps a better question for all of you is what should the NRC be trying to accomplish with this draft test protocol.

Some of the things that I heard about what we should be trying to accomplish is adequacy of the regulatory framework, sufficiency of the models that are used for certification. I used the word sufficiency purposely to avoid the validation and verification, and benchmark labels that we have here.

We heard the term extra regulatory, and I don't know if that was Tom who raised that point, or whether it was John, but what do people mean when they say extra regulatory.

Does that coincide with this public confidence issue? And on public confidence, we had a lot of questions about what does public confidence mean. Mike Baughman raised the issue about what is the relationship to health and safety.

And it is very clear that public confidence has two components to it. One comes from the -- is related to the substantive results of the tests themselves, but there is also a big process component.

And we heard a lot about process. Calvin talked about education, and there was a lot of discussion about that we need to have a better description in the draft test protocol about what we are doing to try to make it accessible.

I mean, you can't change science or engineering, but you can try to explain it, and put it into context, and just think of the phrase, shock absorbers, and that is a useful way to explain that.

Someone said -- we had Kalynda and I don't know whether Kalynda was the one who used the phrase that we need non-expert public opinion, or whether it was Bonnie who talked about that.

And then Diane's point that we should explain what we did not do also. So there is a whole slew of process issues connected to this public confidence. And then I guess when you get through that and given those objectives, what do you need to do to achieve those objectives.

Do you need full-scale testing, or do you need testing to failure, and then we might want to try to put this in context. What is the relationship of testing to failure, to full-scale testing. Someone else talked about to use real world conditions. Is that another way of saying that you don't test to failure?

What will the NRC do with the outcomes, and is it cost beneficial. Is it worth it. So I guess with that, I would ask that before we get into a discussion, do any of you around the table, do any of you have any comments? I mean, is this a useful way to proceed to try to address these issues? Kalynda. Just from an organizational standpoint.

MS. TILGES: I believe that if the questions are posed, then they need to be addressed.

FACILITATOR CAMERON: Okay. Anybody else have a comment before we get started discussing the overarching issues? And I think that some of you may have read the paper that Fred Dilger and Bob Halstead prepared that has an alternative regime in it.

Well, I was hoping that when we get to the various parts of that regime that they will be here to tell us a little bit about that. Is the NRC objectives correct?

Does anybody want to talk about what the objectives of the test should or should not be? I guess that is the best way to start off, is that some of you might not want public confidence to be an objective.

And maybe I will pick on Mike, and go back and start with him. Mike, could you talk about what you were talking about this morning when you were asking about the relationship that public health and safety to public confidence.

And you mentioned at one point that because of the uncertainty that might come out of the results that it could actually reduce public confidence, but let's talk about what should the objectives -- what do you think the objectives of this test plan should be. Mike.

MR. BAUGHMAN: Well, I guess I do not accept the premise that this work will contribute to an increase in public confidence or will increase public confidence. And I think that is a premise that the NRC and Sandia are operating under.

And I would use as an example even the statements that have been made around the table and by members of the audience, and I quote, to instill safety and public confidence will follow.

I don't know the numbers exactly, but I think the DOE folks could suggest to us, or maybe EPRI, that we have had maybe a few thousand successful shipments. And 3,000 is what I am hearing down the table. So, 3,000 shipments without an accident, and without a release, and without a fatality.

And I don't know whether that represents safety or not, but clearly the public is not confident in the safety of shipping nuclear waste. So that begs the question that if we do these studies, which are merely just studies, and it is not real life experience.

It is just some models, and doing models, and dropping a cask, how will that instill a greater level of public confidence in the safety of nuclear waste transportation. So I challenge the premise.

And if you were to reject that premise and just move forward, I do think there is merit in doing the technical studies. There is obviously concern about whether the certification envelope right now encompasses the full range of impacts or accidents that might be addressed.

That suggests regulatory reforms, and so as you have indicated, you are open to that perhaps. I think that during this work to be sure that we are actually certifying casks on an appropriate basis makes some sense.

Whether ultimately that leaves to public confidence or not, I don't think that should be a concern to the NRC. Focus on public safety, and I doubt that you are going to win the public over, and at least the public is represented by a lot of the stakeholders in this room today. But you will have safer casks.

FACILITATOR CAMERON: Okay. And let me ask you some questions about that, and then I want to go over to Bob and others. It seems like what you are saying is that full-scale testing, no matter which way you do it, and no matter how you do it, is not going to increase public confidence.

But that full-scale testing would be useful to confirming aspects of the regulatory framework, either the rules, or the models that are used for certification.

And I guess the big question then is in what significant ways would, if any, would you suggest changing the testing program if our goal was going to be solely regulatory framework rather than an increase in public confidence?

You might be saying let's not make a big deal of this public confidence business, except for perhaps a process aspect. And, Bob, if you are listening to this, I want to get some of your feedback after you hear what Mike says.

MR. BAUGHMAN: Well, I guess I would start with that we have a task one in the protocol which talks about collecting current data on accident history, for example.

I found it a little bit disturbing that that was kind of pushed off to the side, and that you are going to talk about that later. It is not addressed in this document.

From my perspective that Task One, which is the active history is what informs the design of the testing protocols that are laid out for Tasks 2 and 3 as I recall. And I think that is where Bob is coming from.

And that is where the Baltimore Tunnel experience is coming from, is that these real life accidents aren't forming the testing envelope that we should perhaps use, and so I guess I -- well, I can't remember what the question was.

But I do think that we need to design a test protocol which perhaps captures a broader range of real life accidents. Whether those accidents cause a greater or lesser risk, I don't know.

But if you find that your analytical models don't respond properly to those real life accident scenarios, then it does suggest to me that maybe those models need to be revised, and maybe the regulations need to be revised to be sure that we are using a more robust model.

None of that has anything to do with public confidence in my mind.

FACILITATOR CAMERON: Okay. Bob and Diane, all of you have been listening to this. We are looking at what should be the objectives of the test protocols.

And, Bob, you made a comment before that the State of Nevada and Clark County believes that full-scale testing is the most important spent fuel transportation issue. How do you feel about what the objectives as a test should be?

MR. HALSTEAD: Well, so that you know that this fishing tie that I am wearing was a tie that I always wore when I was going to debate Bob Jefferson about cask testing, because we often get to a point where -- and Bob was the guy who masterminded the Sandia tests in the '70s, but sometimes we could not agree on anything but to have a discussion about the relative merits of a Oriole Coachman Tight Streamer (phonetic) on a Number 8 Carlisle Hook, versus a Bud Minlow (phonetic).

So this has been going on for a long time, and so I will start by saying that while I don't change my position on testing, I really agree with a lot of what Mike has said.

And I have said this to many people in Nevada that one of my concerns is that we might succeed in getting our cask testing program through, and getting all of the best available control technologies, and best engineering judgment, extra regulatory safety protocols, and still not have a measurable impact on public confidence because public confidence is undermined by a lot of other things that we don't directly address here.

And on the other hand, I think there probably was a major benefit to public confidence because of the full-scale testing with the TRUPACTs in New Mexico, and Jim might want to add to that later.

And I think that bizarrely the obverse is clearly true; that by continuing to oppose full-scale testing, you erode any public confidence that you have, and it really comes down in my mind to the fact that there is only one good argument against full-scale testing, and it is costs.

And when you actually look at the costs, the costs aren't that good. Now, one of the things that we talked about last time was some things that we were going to add to the record, and I have brought a copy of the 1993 Sandia staff paper that was done I think for DOE, Ken, if I am not mistaken.

And it really just brilliantly shows the advantages and disadvantages of scale model versus scale model. Here is our short list of reasons for --

FACILITATOR CAMERON: Did you say scale model versus scale model?

MR. HALSTEAD: The only advantage of scale model testing is costs, and it doesn't always work out that way anyway, because when you have a half-scale physical model by Buckingham, it causes one accorded by weight, and if you go any smaller, things like your weld bolt seals may not be able to -- you may not be able to accurately predict the scale performance.

And so usually the half-scale replicas is about the smallest model that most people that I have talked to have confidence in. And then when we had some argument last week where, geeze, maybe Sandia was wrong and you don't save that much money with a half-scale replica. At least this was Alan's concern about the Holtec.

Let me say that I think that the case for full-scale testing for the new casks is maybe different than if we were talking about the old casks. First of all, we are talking about a truck cask and four rail casks that might be used for PFS in Yucca Mountain shipments that have not only never been used, they have never been built, with the exception as I understand it of one Holtec OVERPACT.

So you are not talking about those tests that have the 2 million shipment miles of experience. Secondly, the new cask designs are very different from past designs.

And I know there are trade-offs, and I don't belabor this, but there are some very dangerous not spent fuel is shipped to reprocessing facilities in the old days, and now we are planning to ship older, cooler, and less radioactive fuel, and we are going to have an enormous increase, like a 4 to 6-fold increase in the payload in each cask.

And some structural benefits are probably lost with the reduction in shielding that is allowed by inspecting these casks for 5-to-10 year old fuel instead of 180 day cooled fuel.

So the cask designs are not only new ones, but they are significantly different. There are all kinds of innovations in materials, shielding materials, lid closure details, and on top of this, you are talking about an enormous increase in the number of shipments.

And you have 40 times as much fuel, more or less, is going to be shipped each year as was shipped in the past; and 5 to 30 more times more shipments depending on the mode. There is a big increase in the average distance of a shipment, which we think may have significant implications both for equipment performance and human error.

And finally we have to look at the past record of the casks. Now, you can look at these statistics and not be very reassured that the industry's record is 2,000 shipment miles -- I'm sorry, 2 million shipment miles and four accidents, and that is actually not a very good accident rate.

And that is kind of surprising, because you would think with all of the special precautions that the accident rate would be really good. And you look at the accident rate for the WIPP shipments, and it is like what, two in a million shipment miles?

AUDIENCE: No, 1-1/2.

MR. HALSTEAD: But it is still one incident per million miles, and frankly the spooky one is that if you go back and look at what is the frequency of accidents that are with a particular driver, it is one in 2 million shipment miles.

FACILITATOR CAMERON: Well, 1-1/2 million miles was the answer to the question for the record. He didn't get that.

MR. HALSTEAD: For us it is a determination of these reasons, and the cask design issues, and the fact that frankly we are not that impressed with the safety record.

And let me just put in the record two things. I don't know if John Vincent is here today, but John Vincent and Alan made two really good points last week giving the industry perspective.

What Alan said was that you know that the simpler the test the better, and one of the things that we will talk about later is that I am not sure that we can do some of the tests that are in the testing protocol.

But I am pretty sure that we could do the regulatory tests and instrument it, and use that information benchmark codes, as well as secure measured physical data on how the cask actually performs.

Secondly, John Vincent from NEI made a very good point. He said, you know, these accidents that are in the regulations, the 30 mile impact with the unyielding service, which is like a 50 to 60 mile impact with a bridge abutment, followed by a half-hour 1475 degree fire and puncture.

You know, that is not the worse case accident, but it is a fairly severe accident by anyone's standards. And so to say -- and I think you should understand that it means something when people from Nevada, who have spent 20 years doing all kinds of accident studies, including 21 accidents we have not had a response from, from Sandia that we think may have seen those, for us to come to the table and say, no, we are not sure about that fire standard, but having looked at all of this accident data, we think that hypothetical accident is a fairly severe accident, and that is kind of the bottom line. That is what we test the casks to.

And there I don't know that we have to do a lot of expensive, full-scale testing to go beyond that for the failure thresholds, and a complication for us in the thermal is that our consultant, Merritt Berkey, who has 37 years with NTSB, and NIST, has been going over your reports and our reports, and has suggested some different ways to approach the fire test.

But the long and the short of it is that we think that there is a case for full-scale testing, and the only good case against it other than one that Dave Stedeki (phonetic), a BMFL consultant for us told us, that if you just do full-scale testing and take the computer simulations, these smart guys in the fabricator shops are going to slip a prototype by you that is structurally different than what they are going to produce.

And I say with QA and QC, we can prevent that by having an NRC inspector in the shop at all times, and check the paper trail. So, I am acknowledging that there is one good argument by a cask designer against full-scale testing in one of our reports.

I believe that the QA and QC throws that out, and so I think costs is the only reason not to do full-scale, and Mike's bottom line is this. If you do it, it does not guarantee public confidence. But by god, if you don't do it, I can guarantee you that it will erode. That is all I am going to say.

FACILITATOR CAMERON: Just one clarification. This term of extra-regulatory has been used, and I don't know --

MR. HALSTEAD: We will get to that in the technical testing, that definition today.

FACILITATOR CAMERON: But we are talking about objectives here. Does anybody want to -- what does extra regulatory mean? I mean, how many people know? Around the table, who knows?

MR. HALSTEAD: What it means to us is that it means, for example, that instead of having the 30 mile per hour impact, you go with what you have suggested in the testing protocols, a 60 to 90 mile impact, but because you have an impact limiter in there, that changes things.

And with the fire, you would increase the time or the temperature.

FACILITATOR CAMERON: But extra-regulatory is that you are not using that in terms of a specific objective that you want to get out of the test stuff.

MR. HALSTEAD: Sure we are. We are saying that the regulatory accident is spelled out in the regulations, and it is a severe accident. And we want to test the casks to see if they meet that. Frankly, beyond that, you want to do failure analysis which may or may not involve a lot of additional full-scale testing.

And our feedback into the review of the regulations then are the regulations that we are testing to adequate.

FACILITATOR CAMERON: So extra regulatory is tied -- and I am just trying to get this organized in my mind, but extra regulatory is tied to testing to failure, and we don't have to define that now. No?

MR. HALSTEAD: That isn't, and that is

where there is a semantic problem.

FACILITATOR CAMERON: Okay.

MR. HALSTEAD: What I think can be useful here is that what I think about Sandia's proposal is an effort to design tests beyond what are in the hypothetical accident in the regulations, and that are severe enough to challenge containment, but they are replicable tests, and reasonable tests, and they are severe enough to benchmark the codes, but you have not specifically chosen testing failure as an objective for one reason or another.

And it is different for us to say that we want to run the models, and predict where -- for example, predict what internal temperature in the field cladding of the cask causes one percent of the Cesium 137 can be released with (inaudible) aerosol. But that is a pretty good definition of a minimal catastrophic impact.

Or we want to see what type of impact would cause that MPC to breach. Probably it would probably have to be that the MPC adds a lot of strength there. So it is different.

FACILITATOR CAMERON: That was a great explanation, and I think we are beginning to see some of the stages along the spectrum here. Let's go to

Diane, and Judy, and Kalynda, and come back over to Jim these issues. Diane.

MS. NIELSON: Just a perception. I am wondering if the word competence is a little bit like impact limiters.

FACILITATOR CAMERON: Or shock absorbers.

MS. NIELSON: Yes, but I frequently listen to the NRC meetings, and I appreciate what they are saying, that they have confidence in the rules. I was just thinking about the waste confidence rule, which is another of those misnomers.

But to the extent of what you are looking for is confidence from the public in the same sense that you have confidence in the rules, or in the protocols, or in some tests, I think Bob and Mike are right. I think you are not going to get there.

And to the extent and to the process that is helping the public to better understand what you are trying to accomplish, I think this sort of a mechanism -- the report, the discussions we are having -- are helpful.

The last thing that I would want to see is the NRC abandoning the idea that they should be trying to make the public better understand what they are doing. I think the word confidence though is getting in the way.

FACILITATOR CAMERON: Okay. So if we think about competence, it seems like what you are saying is, and I think the implication of what Mike was saying is that if we are going to talk about public confidence, it should be focused on the process aspects.

MS. NIELSON: Well, focus on the results. I think competence is an outcome and I think that safety is an output.

FACILITATOR CAMERON: Okay. Thank you. And we may go back to that. Judy.

MS. TREICHEL: Well, we always get back to definitions, and somebody is talking about one thing, and another person who is hearing it is thinking something else.

And what does it mean when one of us around this table becomes confident, and it means a whole lot of different things. So I am not sure that is a good word for this.

I may think -- and I am one of the unconfident ones, and Mike Baughman will tell you that anytime that you ask him, but I may truly believe that you will make it to PFS from Excel in Minnesota. I may be willing to bet that you can make it there.

That would make me confident. Do I think that PFS is a good idea? No. So it may be that I am failing the test of confidence. So I think we should throw that out. People become confident in doing something for a whole lot of reasons, and generally because they want to do it.

That's why you will see the NRC and DOE around this table being absolutely confident in a lot of things that they are talking about, because they want to do it.

And that is why you will see the public, particularly who opposes this, and particularly the Native Americans who are really threatened more than anybody else, lack confidence because it is a bigger issue. So I think it is probably the wrong word.

But if you are lining up these tests, one of the Federal Agencies that does a pretty good job, and if it comes from me that is a really big deal, is the National Transportation Safety Board.

Their analyses appear to me to be very, very thorough, and open, and not swayed by others. And I am wondering if the people who put together these protocols have gone through and seen with NTSB results from accidents that have happened, where you come by an accident on the street, and you are wondering how in the world did that happen when you see a rail car twisted like a pretzel.

But they find out how all of those things happened, and so have their results been added in for what is an accident that can happen in this situation with this sized vehicle?

FACILITATOR CAMERON: Okay. Thanks, Judy, and at some point I think we need to go to you, and others, and you heard Bob's description of what the difference is between extra regulatory tests and testing to failure.

It is one bus stop so to speak before testing to failure. We have heard some of you saying test the failure, and I guess I would like to get some reaction to what you heard Bob propose, and is that -- in your mind is that something that is acceptable.

But let's go to Kalynda, and over to Jim, before we do that.

MS. TILGES: Kalynda Tilges, Shundahai Network. To my mind, extra regulatory means above and beyond what the regulations call for. Now, given the statements that I have made as far as Shundahai's position on this, I would like to get to a position on the tests that are done and that are not extra regulatory, but all of these testing failures, and random selections from all casks that need to be licensed, that that would end up becoming regulations.

So that the very best test that we could do for the public safety would not be extra regulatory. That would just be a given as part of what is done. I for one am sick to death of just having a bare minimum done by law, and I am sick to death of having costs as an influencing factor on the safety of our children, and our future, and our environment.

And there is no amount of money that could pay for the loss of my child, or anyone else's child. And so money being the bottom line factor, I think is obscene.

And talking about public confidence, I think it is more a matter of public trust, and how do you get to public trust. I think that involves being completely open and completely honest, and for the public to eventually find out that the Nuclear Regulatory Commission, or any other agency for that matter, is willing to go whatever distance it takes to involve the public in these matters.

And to do everything in their power to make sure that the public feels that they are safe. Confidence, like Judy said, is kind of an arbitrary term. But at this point I can tell you that the public has no trust, and until they trust you, and until you prove that you can be trusted, there will be no confidence.

FACILITATOR CAMERON: Jim.

MR. CHANNELL: Well, I want to agree largely with Bob about what he said about full-scale, the hypothetical accident condition test and then the regulations. I really believe that doing those is one thing that will help with confidence.

It will as Bob says, it will keep you from a growing confidence. I think that has been a very important factor. So I think that this should be done as a basic on all the new casks that we are talking about.

I believe that the proposed tests that you are doing will be very useful for two reasons; for checking the codes, and also to give us some data points to use in our risk analysis for the lower probability accidents.

And as confidence is concerned, it may or may not help. And I think that the 75 miles per hour impact test is probably reasonable, because you clearly expect something to happen, but you don't expect it will be a really complete failure.

You may get some surprising results, and if you get some surprising results in those, it could help confidence. But if you don't, then you might have a lot of explaining to do. So I don't think that confidence should be the reason to do it, but I think you should do it.

FACILITATOR CAMERON: Okay. Great. I think that has been a useful discussion on this issue and putting it into perspective. Do we need to talk more about whether the testing should be done to failure, as opposed to testing that goes beyond what the present regulatory scheme is based on?

I am going back to Bob's description of that. Kalynda, I think, clearly indicated testing to failure, and do we need to define that? I mean, how much -- and why you talk on that issue, okay?

MR. KESSLER: Again, failure probably means different things to different people. The way my understanding is of how industry uses it is what you are trying to protect is what we call the primary barrier, and to try to make that into English, what we are talking about is that you want to have a complete envelope that you maintain around the used fuel that you are shipping, and that is what we call the primary barrier.

In the case of the Holtec design, inside there you have the MPC, the multipurpose canister. That is the primary barrier. The cask is not the primary barrier in that particular case.

So if you are going to talk about failure, in terms of something that might lead to some sort of potential release from spent fuel, that is what you need to do.

My understanding is that the test instead has been designed to cause leakage from the cask, but not from this inner canister, at least for the case of the rail cask. I am not quite sure of the truck cask.

Bob Halstead made a point earlier about another potential failure could be a loss or degradation of shielding as something that could cause harm to the public, and certainly it could if you had major loss of shielding in the wrong place, et cetera.

I guess I wold say that as an industry we are less concerned about that. We can certainly put in temporary shielding and move things, but what is more of concern is this maintaining of the envelope, or the primary barrier around things. So in my mind that is what failure is.

FACILITATOR CAMERON: And could you just restate again so that we can all get it, is that the draft test protocol is not at least in terms of the rail cask, is not focusing on the primary barrier.

MR. KESSLER: My read of what is in the draft test protocol, and Ken can correct me since it is his analysis, or Sandia's analysis anyway, is that what they are looking at is a test that might cause some bending of this task.

You know, permanent bending, and not just this thing where it bounces back and it has a final shape, or the plastic strain, using the technical terms, of the cask.

Their analysis at least that they showed and that they published for 75 miles an hour, showed no plastic strain of the inner-canister for the rail shipment, and that is what I am talking about. That difference.

It sounds like what they are saying is that failure is the yielding of the bolts that might cause some sort of opening in the lid of the cask.

FACILITATOR CAMERON: Even though that might not cause any breach of what you call the primary barrier?

MR. KESSLER: Right. If the canister stayed intact, it would not cause any breach. It would not cause any potential release of gases or particular release of fuel, assuming that there were any available.

FACILITATOR CAMERON: So I guess you might -- and going back to public confidence again, is that some people might argue that while you really want to focus on that outside container, the cask, because that would give the public more confidence that they knew that that was going to be intact?

MR. KESSLER: Well, if it is a balancing act that I view the NRC and Sandia trying to between trying to gather data to help collaborate some of these models in this plastic strain region, or this idea when you actually have permanent deformation of something afterwards, versus what gains public confidence, certainly their analysis suggests that they are going to get some permanent deformation of the cask.

And if that is what they are after, this proposed test would probably get them some. Regarding the latter, I can't tell you what it will get them.

FACILITATOR CAMERON: All right. Thank you. Thank you, John. Fred.

MR. DILGER: Fred Dilger, Clark County. I have just two comments to make. The first is -- and I hate to make it a little bit more complicated, but we are going to have to talk about the complexities of a loss of shielding, versus a loss of containment, as a failure problem.

And speaking as a local government representative, in the event of an accident, the first responders are going to be local government folks, and there are going to be State Government folks who arrive on the scene, and knowing, and using your computer models, what kind or being able to estimate what kinds of tactics that might be necessary upon arriving in an accident scene like this will be very helpful.

If we have a loss of shielding event, that might dictate a different set of tactics than if we have a loss of containment event. So we have -- there are a couple of different ways to fail is the bottom line.

And I wanted to just resurrect Dr. Solar's (phonetic) definition of failure last week as an open pathway to the environment, and that is one way that we might want to start as a straw-man to begin the discussion about failure.

FACILITATOR CAMERON: And can you just clarify. You used the term shielding and containment,and we heard about the primary barrier, and the MPC, versus the cask. Does shielding equate to -- and containment equates to -- what?

MR. DILGER: I think that you had better

get a better definition, a more formal definition from some of the other folks around the table. But shielding would mean that we would -- that there would be a greater output of radiation from the container than from an intact container.

And perhaps something that would exceed regulatory limits, but a loss of containment would be a failure to contain the cesium and the other highly radioactive particulates that are in the fuel rod itself.

FACILITATOR CAMERON: Okay. Judy.

MS. TREICHEL: Just as a follow-up, and I asked a version of this before. But isn't it possible that you would be shipping uncanistered fuel and that you may be shipping it by rail in a large rail cask, and uncanistered, I am assuming, would be no MPC.

Aren't there going to be situations where you would be shipping something that does not have this inner-thing, and therefore a failure of the outer shell or the overpack would be your failure?

MR. BRACH: One, there are some casks that are authorized for transport by road or rail that are not multi-purpose canister type casks. The reason in our package performance study for selecting the Holtec cask design, and also for looking at casks of a more modern contemporary design, is that we envision that if a shipper is going to be using rail that they would be looking to maximize the cask loading and minimize the number of shipments.

And that would typically then be the current design of what we call dual-purpose casks, which are multi-purpose canister type cask designs. So the answer to your question is, yes, there are different types of casks, and some have canisters and some do not.

But what we are envisioning, and for example using PFS for the proposed facility, envisions shipping Holtec casks, which is a multi-purpose canister cask, as well as the more current and contemporary spent fuel casks of current design that have larger loadings if you will of spent fuel in the canister, are all multi-purpose canister designs.

MS. TREICHEL: And you don't require that they are in MPCs? If somebody has canister fuel, and they want to ship it not to PFC, or to Yucca Mountain, but they need to transfer it from one utility to another, and they need to for some reason, like a TMI accident or whatever, you do not require that it be in an MPC in order to be on a rail carrier?

MR. BRACH: That is correct. The casks

that you are describing are casks that have fairly smaller contents, but yes, that's correct.

FACILITATOR CAMERON: Let's go to Peggy, and then we will go to Bob, and then maybe we will move to general testing issues. Peggy.

MS. JOHNSON: Just a point of clarification. Is that the cask that you all have chosen, because it is sounding like that to me when you are saying that the reason that we have chosen. I mean, is that a done deal is what I am asking.

MR. BRACH: No. No final decisions have been made on the PFS study, and the types of tests, and the types of casks, and the number of casks. That is the purpose of this discussion today, and the comment period that we are in right now is to ask for comments from you and others on recommendations in regard to the type of cask, the number of casks, and the type of tests and conditions, and parameters.

MS. TREICHEL: Then we are getting back to confidence and trust again, because it sounds to me like you have made that decision in the terms that you are using, and I think that needs to be really clear.

MR. BRACH: Let me apologize for that. What I mentioned was that in our draft test protocol we have identified two candidate casks, a rail cask and a road cask, for testing. And the reasons for selecting the rail cask, the Holtec cask, was that we were picking a cask of current and more recent design that has a larger loading.

That is, number of spent fuel assemblies that can be transported in that canister, compared to some of the older if you will cask designs that have markedly fewer assemblies authorized per shipment, or per cask loading.

But whether it be a Holtec or another vendor's design, there is no selection there. I believe Ken or Andy had mentioned in earlier comments this morning that in our development of the draft test protocol and in trying to describe some of the if you will test summaries and analyses, we had to pick a candidate design to facilitate the modern analysis.

And if you will recall some of the overheads showed some of the visual impact on the center of gravity. For example, impact tests, and showed the velocities and the G-forces that would be exhibited.

We had to pick a cask design if you will for our presentation purposes to represent the type of impact and power tests that we were considering.

FACILITATOR CAMERON: Okay. Bill, did you have some other points before we go to Bob?

MR. BRACH: Well, I did not want to belabor the issue on testing to failure, but I just wanted to put on the table one aspect of testing to failure, and which I think is important to be included in the overall consideration, is a comment that Bob Halstead made earlier about real life accidents.

And I would just offer that in consideration of testing to failure, I think another aspect that needs to be considered in that same type of discussion is the realism of the testing scenarios.

Andy Murphy this morning had mentioned that, for example, the 75 mile per hour impact test, with a casking being dropped on to an unyielding surface is roughly equipment to an impact speed of about 150 miles per hour.

And I only put that into the context as we are considering what might be real life accident scenarios or conditions, and as we are talking about testing to failure, I think that those considerations need to be collectively assessed as they are trying to determine what testing and what failure mechanisms we are looking at and actually trying to envision in a test.

FACILITATOR CAMERON: Okay. Thanks, Bill.

Let's go to Bob and maybe discuss some of these general testing issues, and check in with the audience, and then go to the fire aspect. Bob.

MR. HALSTEAD: Let me first comment on Bill's comments, which I think are well considered about what are the real world accident parameters that we are looking at.

Understand that in Nevada that we look at this differently than you look at it nationally, because we have some unique local conditions, and because of the presence of certain types of military operations, the Hawthorne Weapons Facility, and the Nellis ranges, for example, we unfortunately have real world experience with both truck and rail accidents involving military munitions.

Secondly, I dare say that we have done more research on them than your folks have done. So we have looked at all of the accidents that have occurred around the country, and with craters the size of this room for the horrific 1973 rail accident of military explosives in Marysville, California.

So looking at our unique local conditions, some of which reflect this issue at PFS -- and, for example, I personally believe having looked at the analyses that a jet aircraft hitting a cask has some possibility of causing a small release either because of the fuel loading or the impact of the jet rotor turbine loader.

But what has not been evaluated is what happens if there is even live ordinance that somehow explodes, despite the fact that it is not supposed to explode.

Or if a plane is carrying an MK-1000 dummy bomb, which is basically cement in a shield, or a steel sheaf traveling at 400 or 500 miles per hour, that is an awfully good penetrator.

And so there are some unique local conditions that affect transport in Nevada that we don't think are enveloped either by the regulations or by what is in 6672.

That said, the real issue that I think that we might resolve here is this issue of how these elements like the MPC affect containment. Part of our reason for asking that all the casks that might be used for future shipments be tested is precisely because there is great uncertainty about those cask designs.

And though the welded MPC in the Holtec cask, and pardon me as I know that this sounds like just jargon being driven, you need to understand that we are trying to talk in shorthand so that we are not here until midnight tonight.

PFS is going to receive fuel and not handle it, and so having a welded canister as part of their systems approach makes perfect sense. DOE has said on the other hand that they are considering doing a lot of things at the surface facilities, like fuel blending, possibly doing random fuel inspections.

So if they have an MPC in a rail cask, they have discussed in the past having a bolted closure. Other issues involve the lack of rail access and the difficulty of rail access, I know that people don't want to hear it, but believe you me, I am looking forward to spending the next 5 or 10 years debating a NEPA process if DOE's project goes forward on rail access.

It is not going to be easy to build a railway, and even if you do, it is still possible that about a third of the inventory will come from those 24 difficult to access reactor sites.

So you may still have a lot of truck casks, who as far as I know, none of whom, unless they have damaged fuel, are planning to use a welded canister inside.

So the way that you deal with that is by doing the regulatory tests on all the cask types and then you capture those issues. And frankly I just want to say for the record that Nevada endorsed the DOE MPC proposal back in the mid-1990s, partly because we thought that welded canister ought to be required by regulation.

And we were convinced that it added a lot of protection, and that if it caused problems opening the cask and doing fuel acceptance at the repository, then they would just have to find a way to accommodate that.

But I think that it is important as you finalize your protocol, and hopefully we are going to have another discussion on this, that you realize that that welded canister is a very important issue in whatever testing is done, just as I believe having the impact limiter on, or the assumptions that you make about what type of neutron shield is on a cask, and whether it is solid or water-jacket, and what degree of damage you receive and so on.

But this really would be a good segue if we were going to technical casking. As an advocate of full-scale testing, I will tell you that it is going to be very difficult to do these tests.

And we are respectful of the task that

Sandia or other contractors may be charged with.

FACILITATOR CAMERON: Okay. Do we need to -- how much do we need to discuss the general testing issues? And, Bob, you are talking about a segue to the specific technical issues, then I am assuming that you mean the fire and impact issues.

How much do we go to types of casks, and types of tests? Judy.

MS. TREICHEL: If you are talking about doing a drop test and a fire test, and I am not sure if your tests will be expanded to do anything else, but under current certification do you consider exterior things, like the quality of the infrastructure, like the quality of the rails, the huge rail casks would be coming across, or the strength of the bridges, or the other systems?

Who is in charge of regulating that sort of thing, and if people wanted to comment on that, is that even within the scope of this?

MR. BRACH: Let me just answer the first part of the question, and I will look to Rick Boyle from DOT on the rail and transportation aspects. The NRC certificates, or the application that comes to the NRC for a certificate for an NRC package is just for the package.

For example, one of the schematics had a picture of a Holtec, and the GA-4. The application that the NRC would use, and would find acceptable if we approve, is of the transportation package; and the conveyance that goes on, and whether it be a truck or a rail, and the upkeep and the quality with regard to maintaining the status of the rail.

And I will stop there and yield to Rick Boyle from DOT to address the rail and transportation aspects.

MR. BOYLE: Yes, the Department of Transportation does the safety of the infrastructure, and in simple terms that means the Federal Highway Department would go out and inspect the roads, and make sure that they are built properly and maintained properly.

And they could make comments as to what could go on those and what cannot go on those. The Federal Railroad Administration would work the same way for railroads, as far as they have graded track, and as to what weight limits and what speed restrictions there are for each type of track.

And they are not here today, and that would be totally independent and that is a little bit of the split between the Department of Transportation's regulatory authority and the NRC's is that they do the cask, and we do the actual transport of it.

And the mode of conveyance, and inspecting locomotives, and inspecting rail cars, and that is the Department of Transportation.

FACILITATOR CAMERON: Okay. Thank you. And, Judy, I am assuming that answers your question?

MS. TREICHEL: Yes, because I saw some of the things on your list where you are talking about a delay in shipping, and that would have nothing to do with whether or not the cask is certified. It is just going to be a parked certified cask and it wouldn't have anything to do with whether or not you certified it.

And so there are things on there that are outside of --

FACILITATOR CAMERON: When you are referring to a list, what are you --

MS. TREICHEL: Right there. Your handwriting.

FACILITATOR CAMERON: Oh, this is any -- in terms of the types of cask, I just was trying to summarize what people had suggested. But any cask that might be used in shipping waste.

Okay. We are going to get into fire and I am going to ask Amy to cue that up in a minute, but I wanted to see if there were any comments or questions out here in the audience on the overarching issues discussion that you heard or any of this. Are there any questions or comments?

All right. Let's start with John, and then we will work back that way. Oh, I'm sorry, let's start over here.

MS. TRUMMEL: I am Candice Trummel, Nye County Commissioner, and my question is with all of this talk about testing to failure, why? Is it going to change whether or not the cask gets certified, and if it is not going to change whether or not it gets certified, then why are we going to invest the money to test when it is going to fail and give that information out to possibly terrorists so that they know exactly what they have to do in order to make the cask fail. I just don't understand the purpose.

FACILITATOR CAMERON: Good question. Do we have answers to that? I guess Bob and Fred do. Well, let's go to Bob, and then we will go to Fed.

MR. HALSTEAD: Well, let's focus this on the fire, because that is the one that we studied them most and have the greatest concern about. Yes, you are right. There is a security issue here.

And it just does not deal with testing cask vulnerability to things like anti-tank weapons, but it has to do with the fact that you may have terrorists or saboteurs attempting to cause a worst case accident.

Now, I agree that that is a problem. On the other hand, from my standpoint of advising the State, I have a responsibility to try and evaluate whether the existing regulations -- and, for example, with the fire, encompass some reasonable level of what a predictable worst case fire is.

To make this long story short, I have absolutely no doubt that if we do an honest testing program, and we find that there is a problem with the fire test, one, I think it is very unlikely that the NRC would not propose a rule making to address that.

And in the event that they did, it would be extremely politically controversial, and I think you would see the Congress stepping in. There is a very -- and understand that we have a bipartisan delegation in Nevada, and believe you me, we talked to their staff people last night, and they are all following this with an unusual degree of attention to detail.

And basically what they have said is that they think that we should participate in this process and see if it is possible to deal with these safety issues without requiring new legislation.

But that is the point. I mean, I think in fact Jim's point with the TRUPACT testing was -- and I would even argue with the Sandia testing in the '70s, and I would argue with the British testing in the '80s, every time that honest full-scale testing has been done, the test crew found things that were essential to safety that they had not anticipated.

And in the British tests, you can argue that the leak from the lid was below regulatory concern, but my goodness, they went back and they redesigned that lid to make it even better.

And in the case of the TRUPAC there were a number of things, notably the O-Ring (phonetic), and in the Sandia testing a whole body of knowledge about the significance of the tie downs that attached the truck cask to the truck trailer, and the necessity of designing them so that they have the correct breakaway strength.

So I don't at all say that we won't learn things from this testing, and we will end up changing our standards. And I don't know that it will make the public more confident, but I will have done my job in advising the State about what makes good safety.

FACILITATOR CAMERON: The short answer is that if indeed it might -- and I am not being facetious, but indeed it might show some defect in the regulatory framework.

MR. HALSTEAD: Absolutely.

FACILITATOR CAMERON: And let's hear from Fred and then we will see if that answers your question, Candice.

MR. DILGER: Two points on that. The first is that I will go back to my comments about first responders. About a year-and-a-half ago, a tire came off -- and I think it was a bakery truck, and caused an accident that caused -- I think it was a 2-1/2 hour fire over on U.S. 95.

It was so hot and burned for so long that it ruined the structural integrity of the Flamingo overpass over U.S. 95. And that overpass had to be reconstructed.

The reason that our firefighters didn't go in and put it out earlier and allowed it to burn out was because they did not want to cause more damage by using the flames or by using their foam to put that fire out.

By testing to failure, I think that we will learn something about where those thresholds are that will be useful in the event of an accident. So we will have some indication of what our tactics have to be in the event of an incredibly severe accident.

So that is one aspect of that, and the other one was a general testing issue that I didn't bring up, and that I might have here, or that I will hear, and that is that I do not see that there is that much additional modular costs associated with testing to failure.

As I talked to people who have tested these things professionally, and who have been associated with it before, as I understand it, for the fire testing in particular, you dose the canister or the cask in jet fuel, and then you light it up, and then you have your monitors monitoring.

And so letting the actual cost of testing that canister until there is an open pathway to the environment, for example, as one definition of failure is not actually all that great. It is extra fuel, and it is extra labor, and everybody has to work late that night.

And it is running the computers a little extra longer, and so I don't see that in the context of doing full-scale regulatory casks, or testing like this, I don't see that the costs would be that much greater.

FACILITATOR CAMERON: Okay. Candice, does that answer your question? All right. And, Fred, you mentioned first responders a couple of times, and is that something that the NRC should specifically factor in in terms of what should come out of the tests?

MR. DILGER: I think no is the short answer. I think that the NRC has the public safety or has the obligation to protect public safety and they should do that.

However, I think that testing like this full-scale would generate knowledge that would be useful to first-responders, and plotting our first-responders, but I don't think that you should let the fire department drive the train on how you test.

FACILITATOR CAMERON: All right. Thank you. Yes, sir, can you just give us your name, please?

MR. LEE: My name is David Lee. This is my first time being exposed to this type of public meeting. I have a few comments. The first one is if this test is going to cost $20 million roughly, we ought to spend the money more meaningfully by discovering a few things.

And by designing the tests and restricting it to 75 miles per hour, 30 minutes for 800 degrees, we may already know the answer to the test, and spending that $20 million sounds to me like something that is nothing more than a purely public relations show.

And I think that is not the best way to spend this $20 million, and personally I hope that by spending that $20 million on at least 10 major scientific discoveries may be lying there for us to discover.

This morning I also heard a call to focus on the issue, which is the types of test, and I want to comment on that. Two types of tests that we know of are railroad type and truck type.

Well, I propose that there is a third type, and I call it crusty (phonetic) type. And I am using an analogy of baseball. A good pitcher can pitch a baseball at a speed of 80 or 90 miles per hour, which is fine in excess of 75 miles.

Incidentally, this morning I heard someone say that 75 miles translates into the equivalent of 150 miles, and I do not think that there is any scientific basis, because the non-yielding object has zero speed, and therefore however you look at it, there is nothing moving in a speed of 150 miles.

If you could double 75 miles by two, you could call it a hundred miles, or 200 miles. I did not understand that remark of 150 miles. My point is that we probably know the outcome of the tests, and that let's spend this money for something better.

And coming back to my remark about the baseball. A baseball travels at 80 miles to 90 miles per hour, and the batter swings the bat maybe 50 to 80 miles per hour, and that adds up to well over a hundred miles per hour.

And that impact on the ball, there are very few baseballs that would be broken, and that is a real live test. Now, we know that 75 miles to me was arbitrary, and probably the higher speed may be called for.

And also incidentally the baseball has a prosticity and some other scientific terminology if formability was the issue. The physical principles being used distribute the stress throughout the entire cask, and that appears to be one alternative that ought to be studied so that this impact is not confined to just one spot where the collision occurs.

And so offhand there is a third type, and that the current study has not addressed, and I use that as one example to make this comment. Thank you.

FACILITATOR CAMERON: Thank you, David. There is a couple of people over here who wanted to talk. Go ahead.

MR. AMMERMAN: Doug Ammerman, from Sandia Labs. I have a couple of comments about probability. One of the things that Bob talked about is an airplane crashing into a cask. I don't know how many millions of truck miles that are transported in Nevada per year, but it is millions I'm sure, and probably hundreds of millions.

And how often has a truck been impacted by a crashing airplane? I have not seen anything in the press about it happening, and so I would guess that the answer is none. So the probability of an accident is very small. It does not pass the rules for testing that we are talking about for these packages.

And also today we had a comment about that we didn't expect to see the Columbia fall out of the sky. The probability of that accident is about 1 in 100 of a failure of a space shuttle. If we don't expect to see something happen in the probability of 1 in 100, why are we expecting to see something that happens in a probability of one in a million or less for the package performance study. Thank you.

FACILITATOR CAMERON: All right. Thank you for bringing the probability issue up. Bob, I am going to let you respond to that.

MR. HALSTEAD: Well, I would just know that the Department of Energy thought that this was such a serious issue that in their draft environmental impact for the Yucca Mountain assessment in 1986, they acknowledged that it was a unique local condition, and that if it were a disqualifying factor, Yucca Mountain would have been disqualified because of the potential threat of aircraft overflights.

They later decided to address this in their final EIS, where they -- and I don't remember the exact probability, but if you will leave me your card I will get it to you, but the way that they addressed the issue was by saying, well, it could happen, and it is credible and we have to look at it, but the impact would not be sufficient to cause major damage to the cask, both because of the fuel loading, and because the aircraft is essentially a soft-body object, with a few exceptions.

And unfortunately they left out the fact that many of the airplanes flying on training missions, particularly at the Nellis range on both the northside of -- well, in the Green Lake area and in the Indian Springs area, are aircraft that are both carrying live munitions and dummy bombs, which are such good penetrators.

And. Diane, you may want to speak to this, but my understanding is that a major issue for the PFS license denial, permit denial, was the demonstrated ability of these dummy bombs to be used to take out Iraqi Radar Stations in situations where you want to smash up a structure without putting a lot of shrapnel out that kills a lot of people.

So I dispute your contention that this isn't something that we need to worry about. There is a straightforward way to deal with it, and so far the Department of Energy hasn't chosen to deal with it.

Now, whether it is a concern to the NRC, we would find out in licensing, but I think it is very significant that yesterday the whole future of the PFS storage facility in Utah was thrown into question by exactly this issue of the probability of an aircraft impact.

Now, it is true that they were primarily talking about impacts with stationary casks, but it is a very significant issue in our minds.

FACILITATOR CAMERON: Okay. Thanks, Bob. Kalynda, did you want to say anything in response to that?

MS. TILGES: Absolutely. I also reject your contention. Let's go back to low probability accidents of the Titanic, the Exxon Valdez, the Challenger, and the Columbia. Now, I am curious as to -- and I realize that those were low probabilities, but they are listed as some of the greatest disasters in our history.

And I am curious as to how many of those deaths were acceptable in our eyes, and we are talking about the safety of the American public. Then if there is any possibility whatsoever, this government has to address that, and has to make this public feel like they are safe.

But one of the problems is that it is not just this mistrust of the DOE, or the NRC. I see in this country the overall mistrust of our government. And I don't see our government doing anything to relieve those fears.

The public, I don't think, feels that any of those deaths, or any of the deaths of their children, or their relatives, are acceptable. And again when I say if there is any possibility whatsoever, then we have to do our very best to make sure that that doesn't happen.

I realize that nothing is a hundred percent, but at the same time we should not be glib about who is expendable. Thank you.

FACILITATOR CAMERON: Okay. Let's go to John. John, do you have a question or a comment?

MR. HADDER: Yes. John Hadder, Citizen Alert. I wanted to make a couple of comments about the discussion of overarching incompetence and so forth. Confidence, at least in the minds of Nevada, since I have been working with Citizen Alert, is something that is earned, and something that gets lost.

And over the years, I think that the Department of Energy has really faced this issue with the Yucca Mountain project and also with the Nevada Test Site with confidence lost.

And so I think that as a goal, I don't think the NRC should really look at public confidence as a goal for this, but if you follow a good process, and you do the testing complete, and sort of in the format that Bob Halstead and Fred Dilger had outlined, you would begin to earn that trust over time.

Time will tell, and I don't think that there is any one thing that you are going to be able to do in the short term that is going to give you that trust. It just is not going to happen.

But over time if the proper procedures are followed, and if these casks are tested, and if all casks are tested that will be used, then over time the public will begin to say, okay, I guess they are looking after our safety.

That is my perception anyway since working at Citizen Alert. So do it right and do it complete, and up front, and eventually you may get that confidence back.

I think that it is also important that the issue of real world accidents be addressed as part of this as well. One of the things that we get a lot of is, well, how do these casks stand up to this, this, and this scenario.

And so I think that it is important in the process that the tests that you do connect and that you try to draw those lines. Make those connections between what are the kinds of things that are out there and the routine, and the credible, and the severe credible, all those possibilities.

And we will be discussing this Baltimore Tunnel fire soon, and I am sure that is one of them, but a lot of times there can be situations where the casks may experience multiple percussive events if on a derailment and a railroad track that goes along a canyon wall or something.

And I believe that one of the transportation routes in the Yucca Mountain project goes through the Rocky Mountains, and I believe there are several stretches there along fairly steep embankments.

And so that is another issue and the cask testing involves a single impact, and we are talking about multiple impacts, and what happens there. Can you create lines between the testing that you want to do and these accidents, and can you create lines between these railroad accidents and the licensing requirements.

Can you make those lines and can you make the connection, and can you make that connection also with your models that you use also. So I think it is really important for what the public is asking for.

And so it needs to be real, and they have to be viable, and they have to be accurate for the public to even believe it. In terms of some of the probabilities, I think that the problems with discussions around terrorism is that you can't calculate probabilities.

We don't really have the numerics to do that in general. If we did, well, we probably could apprehend some of these things before they happen. I think the biggest factor in terms of the terrorism issue with the casks has probably mostly to do with the transportation scheme that we might be looking at, especially with Yucca Mountain.

The vast number of miles and over an enormous number of years, the repetition over weeks, and that is probably where the major danger lies. In some scenarios that I have heard about around terrorism, using penetrating type weapons, it is probably unlikely that you will be able to design a cask that is feasible to transport and be able to withstand that kind of armament.

That is probably just the reality of moving this kind of waste, and that is a public decision as to whether it is okay to move waste over these long distances, knowing that that is out there, and we may not be able to hopefully guard against it.

But I think that the distances are a critical issue there, and then I don't think that we can really get a good probability on what is going to happen there. So those are some comments about the directions of this, and I think that it should be pursued. Thank you.

FACILITATOR CAMERON: Okay. Thank you, John. And we are going to move into the specifics of the fire aspects of the test then. Amy Snyder is going to tell us a little bit about that, and put the

Baltimore Tunnel fire presentation into the context of the test protocol.

Amy is relatively new with the NRC. She has now been with us since the year 2000, and she is the project manager for the Spent Fuel Project Office, Bill's office, on this draft test protocol.

Her previous work at the NRC was being the project manager for the clean up of the West Valley demonstration project. Before that, she worked several years in the private sector as a health physicist on decommissioning projects.

And she was an officer and still is, or was an officer in the United States Air Force, and she has a Masters in Health Physics from the University of Cincinnati, and a Masters in Management from Wesley College, and a Bachelors in Geological Sciences from the State University of New York. And with that, Amy, tell us about fire.

MS. SNYDER: Good afternoon. The NRC appreciates your participation in this workshop, and I am glad to have the opportunity to discuss with you this afternoon fire testing protocols.

An important part of the process of the design testing involves an interpretation of the relationship between potential radiological hazards and real world severe accidents.

And in the NRC transportation studies, we have done that, and we will continue to do this in the future in package performance studies. In July of 2001, the Baltimore Tunnel fire occurred. The Commission asked us to evaluate this regarding the transportation of spent nuclear fuel.

We did that we are about to have an important discussion about what we learned from that evaluation, and how it compares to the package performance test protocols.

The State of Nevada has also evaluated the Baltimore Tunnel fire, and has drawn some conclusions. The NRC plans to meet with the State of Nevada to address or to discuss our findings and a date has not yet been established for that.

But before we discuss the Baltimore tunnel fire, what I would like to do is to review with you the staff's proposal for the fire testing. And then Chris Bajwa will discuss the Baltimore tunnel fire. Then we will have an opportunity to discuss or to open it up for the workshop to talk about fire testing issues.

You saw earlier this morning in Mr. Sorenson's presentation where he talked about fire testing, or what the process is that we are proposing, and we went to this calorimeter to gather the necessary background and information on fires, such as temperatures and heat flux.

And then we use that to benchmark the fire code that we will be using so that we can more accurately monitor the fire. Our next step is that we are going to introduce some monitoring to determine the response of the cask to the fire environment, and we will be making predictions.

Then we will do the tests and compare the results. As I said, the staff prefers full-scale testing of both rail and truck casks. And we actually will be doing physical testing on rail certified casks.

The staff believes that the fire should be a fully engulfed venue (inaudible), and as Andy Murphy explained to you earlier this morning, a fully engulfing fire is one that completely surrounds the cask.

And the NRC is proposing that jet fuel be used, a hydrocarbon fuel source. The staff proposes to conduct the fire test for more than 30 minutes, and in the test protocols, there is preliminary modeling done from zero to sixty minutes, but an exact time to the devotion of the fire test has not been based, and we want to get your comments and input on that.

There are many ways in which fire testing can be conducted, and we would like to know what you think and how you would specifically answer these two questions. The fire test as we will discuss in the test protocols, we will examine changes in temperature and heat flux. What should the duration of the cask test be.

And you saw in Mr. Sorenson's presentation this morning that there were three different positions of the cask in the preliminary modeling; on the ground, one meter above the ground, and the cask positioned (inaudible). So what should the position of the cask be for a fire test.

Your comments, and concerns, and ideas, and suggestions are welcome, and we will consider all of your comments. As I said earlier, the NRC has not made any final decisions, and we plan on developing detailed cask testing procedures, and in those we will consider your comments, and most importantly, explain why we have done what we have done, and what comments we have not incorporated.

And we just not have at this point determined what format we will be doing that in. So with that, I would like to move on to the Baltimore

Tunnel fire presentation with Chris.

MS. TREICHEL: What did you mean by certified casks? Did you mean certified casks or did you mean those being considered for certification?

MS. SNYDER: Well, one of the criteria or the criteria are the casks that are proposed, we must feel that they are going to be used, and that there is a high probability of being in the work force, and that they are certified casks.

FACILITATOR CAMERON: Does that answer your question?

MS. TREICHEL: I guess.

FACILITATOR CAMERON: Okay. Well, Chris will also chime in on that, and we will get him up here now. This is Chris Bajwa, and he also works with Bill Brach in the Spent Fuel Project Office.

He is a thermal engineer in that office. He has been with the Commission for 10 years, working on various activities related to fire protection, including fire protection issues in nuclear reactors.

And Chris is responsible for conducting the thermal and containment reviews of the spent fuel casks that come in for certification, as well as other types of radioactive materials packaging.

He has a Bachelors degree in Mechanical

Engineering from the Stevens Institute of Technology, and he is a registered professional engineer in the State of Maryland. And with that, I will turn it over to you, Chris. And if you want to add to the answer to Judy's question, please do.

MR. BAJWA: Sure. And before I get started, and before I answer Judy's question, I have some animations in this presentation, and they obviously won't come to life in the slides that you have in front of you.

So if some of you would like to move down to this side of the room, you will probably be able to see them a little better. Otherwise, maybe later when we take a break, I can show them to you up here if you would like to see them.

Just a word about cask certification. When a vendor wishes to certify a cask, they send the information on that design into the Nuclear Regulatory Commission. So we review the design and that is what we certify.

You may get the picture that we go out and look at a physical cask and say okay, you know, it passes the test and we certify it. No, we certify the design, and then that cask is built according to the design that we certify.

So hopefully that clarifies the question there. The Baltimore Tunnel fire. I am sure that a lot of you in this room, if not all of you in this room, have heard about the event. It happened in July of 2001.

What I am going to do in my presentation today is kind of separate a little bit of the fact and the fiction, and the truth, and the untruth, and talk about what happened in the Baltimore Tunnel fire, and based on some of the work that we have done with the National Transportation Safety Board, who investigated that accident.

And to hopefully give you a clear picture of what actually happened, and what are its effects on the transportation of spent nuclear fuel could be. So I am going to tell you some of the facts about the Baltimore Tunnel fire accident, and I will tell you about the National Transportation Safety Board, and the investigation that they are doing, and an investigation that is ongoing.

In fact, they have not finalized their reports on that particular accident yet, and I will tell you about a certified model that we had the National Institutes of Standards and Technology do for us, and they are formerly the Bureau of Standards.

And I will tell you a little bit about the model that they gave of the Howard Street tunnel fire, and then I will tell you about a spent fuel transportation cask analysis that we did to look at the effects of that fire on a spent fuel transportation cask design, and then we will show some of the conclusions that the staff had.

The Baltimore Tunnel fire. These are from the event taken both after -- well, during the event and afterwards. It occurred on July 18th of 2001. A CSX freight train was traveling through the Howard Street tunnel in downtown Baltimore, Maryland.

And that particular freight train had 60 cars, and 11 of those cars derailed while the train was passing through the tunnel. During the derailment a tank car carrying liquid tripropylene, which is a flammable liquid, was punctured, and the fire followed that derailment.

And so just to go through some of these pictures that you have in the slides in front of you, up here is the picture of the actual tank car, which was the source of the fire that occurred in the tunnel.

Back here is actually the west portal of the tunnel, and that was the entrance of the tunnel.

Down here is the hole that was actually punched into the tanker car during the derailment, and the hole is about 1.5 inches in diameter, or was 1.5 inches round.

This is the picture that was taken during the fire, and this is the east portal or the exist of the tunnel, and this is a picture of that same eastern portal taken I think about a year after the fire. So after everything had been cleaned up.

Now, it is important to say a couple of things. First of all, this tunnel is a single rail tunnel. In other words, only one train can pass through that tunnel at any given time.

The other thing to keep in mind is that the duration of the fire has been a big question. In the media, it has been reported that the fire lasted several days, and the last reports that we have now based on National Transportation Safety Board information, the information that they got fromthe people who responded to this fire, that the most severe portion of the fire did not last for much more than 3 hours.

So the most severe portion of that fire lasted about 3 hours. Now, there were other flammable materials on that train. Several of the rail cars had paper products on them, and as we all know, if you light something and it is paper, it will burn.

And it was thought that several of those cars had paper burning inside of them for a couple of days after the accident. Of course, they were not burning at a high temperature, because paper does not burn that hot, and there was not enough of it to sustain a fire at a very high temperature.

So in order to get our hands around what actually happened in Baltimore, we did coordinate with the National Transportation Safety Board, the lead investigative agency for major transportation accidents in the United States.

We first met with them in September of 2001, and have had several meetings since then to exchange information on the facts of the accident itself. The cause of the derailment was the primary concern.

The derailment -- it is known now that the derailment happened before the fire. Everything seems to point in that direction. So the NTSB really focused on the derailment, and they were not going to pursue an official analysis or a review of the fire.

So we decided that we were more interested in the fire, and what affect that fire would have on spent nuclear fuel, the transportation of spent nuclear fuel.

So the NTSB was fully supportive, and has been fully supportive of our efforts to look at the fire that occurred. They provided information and data, and technical expertise in the events, and they also provided access to us, our staff, to the actual rail cars that were removed from the tunnel after the fire happened.

There was a lot of good information that you could get from what was left over after the Baltimore Tunnel fire. Now, there are a couple of different ways we could have approached what happened.

There was not a whole lot of good information on what the fire was like. We have reports in the media, and some people speculated as to what the temperatures might have been. We had some reports of the glowing of the brick that was in the tunnel, and the glowing of the metal on some of the old cars.

And there is some information that you can glean from that, and we felt that the best way to get a characterization of the fire that took place in that tunnel was to do a model of it.

So we went to the National Institute of Standards and Technology to model the fire for us. And they used a computer code called the Fire Dynamic

Stimulator.

Now, what NIST has done is that basically they have taken information on how fires burn, and they have taken what temperatures it will burn at, and they have taken what happens with chemical reactions when you actually light something on fire.

And they have modeled that in a computer code, and they have been able to take actual fires and model them in a computer code and get results that were roughly the same as was happening in these actual fires.

And in fact local fire departments have gone to NIST to model fires that happened in buildings to see why this fire occurred, and how it turned, and how the building was damaged, and why didn't the sprinkler system go off.

So it has been used in a number of areas to figure out how fire responds, and how it operates. So we went to ask them to do a tunnel fire and this was something that they had not done yet.

And so they went through the same process, and they got data from a tunnel fire test program that was done in West Virginia. There were several fires that were set, controlled fires, in an abandoned highway tunnel in West Virginia, and there was a lot of data taken from those fires.

And what the fire modeling that NIST did was that they said, okay, let's look at a couple of these fires, and model it using our code, the FDS, and see if we can match the data with what actually happened.

And so they did a couple of fires and were able to match very closely to the test data that was out there. And so they felt that they could take this FDS tool and model the Howard Street tunnel fire with some assurance that they were going to get close to what happened in reality.

Now, you are never going to get to the exact incident in a computer model, but we felt that we were close enough in this case to give us the data that we needed to analyze the effects of a fire on a spent fuel cask.

The NIST model took into account the entire Howard Street tunnel, which is 1.7 miles in length, and it was a 3-dimensional model, and so it modeled the entire geometry of the tunnel.

They also modeled all the rail cars that were in the tunnel at the time of the fire. So it actually included everything that was in place when this fire was occurring in their Howard Street tunnel model.

Tripropylene was the fuel that was used in the fire model, and there was no ventilation in the model that they put together because the manual ventilation system in the tunnel was not activated while the fire was happening.

In this particular model the steady state or constant conditions were reached about 30 minutes into the simulation. Now, let me explain what that means.

Basically, NIST ran their model for about 30 minutes, and they looked at what the temperatures were in the tunnel, the surfaces of the rail cars, and the surfaces of the tunnel walls, and then the gas, the hot gases that were in that tunnel while they were running this fire model.

And about 30 minutes into their simulation, they had basically reached a steady state condition. In other words, those temperatures weren't increasing. Now, this is the gas above the rail cars, and the surfaces of the tunnel, and the surfaces of the rail cars.

And those temperatures weren't increasing, and so they had reached a steady state condition. Now, this is one of the animations of the NIST tunnel fire model, and what you are seeing here is combustion.

In other words, this is what the flames may look like, and I'm sorry, it is not very clear for you sitting out in the audience, but you can see it on the computer and it is much better if you would like to later.

This is a picture of the combustion that was happening, and what we have here is that these are the rail cars, and there is a green one and a red one here, and of course it is very hard to see.

And the length is from about here to here, and that is a rail car. The tripropylene here, there is a pool of tripropylene here, and this is the tripropylene tanker car.

And so what you are seeing is combustion within the tunnel. Now when it is calculated for temperatures, is that in the flaming areas of the fire, or in other words, in these flaming regions here, if you stuck a thermometer in there, you would see a reading of about 1,800 -- a maximum reading during this simulation of 1,800 degrees fahrenheit. That is pretty hot.

Now, if you take the surface up here of the tunnel and put a thermometer right on the surface at the ceiling of the tunnel, you would see a temperature of about 1,500 degrees fahrenheit, with a maximum temperature for the entire simulation.

And if you took an average of the gas temperature above the rail cars, or in other words, in the ceiling portion, there are obviously hot gases from the fire.

We have seen temperatures of about 900 degrees fahrenheit, and that is averaged over a length of about four rail cars in this simulation. Again, quite hot.

What you will see later is that as you move down towards the bottom of this tunnel, the temperatures drop off fairly rapidly, especially when you move away from the fire. The other thing to keep in mind here is that this tunnel is sloped.

It is sloped at a very slight degree, 0.8 percent slope, going from the beginning of the tunnel to the end of the tunnel. So in this fire simulation, from this end to this end there is a slope of 0.8 percent, and you can't see that.

And that is part of the reason why these flames are leaning over towards the exit of the tunnel. The fire goes to where the oxygen is, and in this case these flames were leaning over towards the end of the tunnel.

All right. This is just basically a summation of what you just saw. When we look at the fire, this is degrees fahrenheit on here, and this is the upper slope of the tunnel. The fire is located at zero in this particular diagram.

So as you start at the top here towards the ceiling, you are getting pretty close to 1,800 degrees fahrenheit. As you move down from the ceiling of the tunnel, you get to the top of the rail cars, and you get to the wall of the tunnel here, and you get to the bottom of what looks like the rail cars, the side of the tunnel, and then on down here to the floor of the tunnel.

And as you can see the temperatures come down as you move from the ceiling to the floor, and the temperatures are slightly higher to the exit side of the tunnel.

So as you move away from the fire towards the exit of the tunnel the temperatures are slightly higher. So that is what NIST told us happened in the Howard Street tunnel, and that was their simulation of that.

What we also had to look at was the actual materials that came out of the tunnel. There were several rail cars, and there was the paint on the rail cars, and some of it was charred and some of it was not. The containment car itself was pretty burned up, but was still fully intact.

So what we did is that we went to the Center for Nuclear Waste and Regulatory Analysis, and that is based out of the Southwest Research in San Antonio, Texas.

At that facility, they have people who are experts in materials, and how materials behave, and experts in fire, and how fire behaves. What kind of temperatures do fires burn at, and they did several -- they took samples from some of the rail cars that were in that tunnel, and they looked at what these particular pieces of materials saw in the Howard Street tunnel.

They did metallurgical analysis on some of the samples, and they looked at the paint that charred, and they were able to collaborate that with the temperature at which paint will char. They looked at materials that actually melted during the fire.

And they looked at the distance those materials were from where the fire supposedly was, and they were able to tell us what they thought these particular materials saw as far as a temperature and a duration.

And those particular results were reported by the CNWRA were consistent with what we were seeing in this tunnel fire model. So we had a fair amount of confidence in what this fire model was telling us about the temperatures in that tunnel during the fire.

The next step for us was to look at what that type of fire -- what kind of impact that type of fire would have on a spent fuel transportation cask. You have seen a similar graphic in some of the previous presentations.

In this particular analysis, which shows the Holtec Hi Star 100, and this was not done in coordination with the PPS study, and so the choice of the Holtec Hi Star 100 was not coordinated with the choice of the Holtec Hi Star 100 for the PPS. I was working on this separately and decided that this particular cask would be a good one to look at.

Some of the graphics here, just to run through it very quickly, this is the MPC which we have talked a lot about, and this particular model has 24 spent fuel assemblies in it.

You can see the closure lid and the overpack, and obviously the impact limiters or shock absorbers as we like to call them. This is a rendering of the Holtec Hi Star cask on a special designed rail car, and this one gives you a better picture of what it would actually look like if it was traveling by rail.

We would have the impact limiters in place on either end of the cask, and this is a cradle in which the cask sits, and then is secured by tie-down straps.

Now, this is a computer rendering, and this is not an actual photograph. I think before we had an actual photograph of one on a specially designed rail car.

What we did is we put together a computer analysis model, and this particular graphic shows that model, and here we have the cradle in which it sits. It is two dimensional and so we are looking at a cross-section, a slice, of the cask.

And 24 fuel assemblies, and the MPC shell here, and supports for the basket, and the basket which holds the actual fuel assemblies. And you have the MPC shell, and the steel overpack, and then this is the neutron shield material, which is held in stainless steel compartments.

Just a little design and the detail to zoom in a little bit on the model. This is a spent fuel assembly and a representation of a spent fuel assembly, and you can see the supports for the basket here, and the MPC shell.

And so this is what we decided that we would use to see what the effects of the tunnel fire would be on this cask if it were in that particular Howard Street tunnel fire.

What we did was we took this data from that NIST tunnel fire model, and we took the temperatures that they had calculated, and the maximum temperatures that they had calculated, and the flow. Now one of the things that is important about a fire is that when a fire starts, it will draw oxygen into it to keep it going, and it wants to sustain itself that way.

So it will create a large amount of flow and turbulence within the fire. In other words, if you look at a fire, it is not only always a very steady flame. There is a lot of movement in the flame, and there is a lot of flow around a fire.

And if some of you are able to observe the full-scale test that eventually is done as part of the package performance study, you will know what turbulence in a fire is about. You will be able to witness it and see it.

We did two assessments. The first assessment was the center of the cask, that model that you saw there, was located 20 meters from the fire source, and that is per current Federal regulations.

The Department of Transportation's regulations currently say that if you are going to transport any kind of radioactive material, it must be separated at least one rail car length away from any hazardous materials.

So tripropylene is a hazardous material, and had a spent fuel cask been on that train being transported, it would have to be separated by at least one rail car length from that tripropylene tanker car.

So we felt that was a realistic assessment of the cask, 20 meters away from the fire source. The next assessment that we did was a cask located adjacent to the fire.

The center of that particular cask was located 5 meters from the fire source. So that was a little bit closer to the fire source. These are our results based on the model that we ran, and we ran the model for a total of 150 hours. In other words, we ran the temperature exposure of that particular fire for 150 hours on the model of the spent fuel cask.

And you will see that at 20 meters, these are the different temperature plots of a model, and fuel here at the bottom, and a canister shell, and a canister inner-shell, or a cask inner-shell, a gamma shield here, and then the cask outer surface.

And the regulatory limit for fuel cladding, or in other words, for spent nuclear fuel, the regulatory limit short term temperature on it is 1,058 degrees fahrenheit.

When we certify a cask, it must show that the fuel cladding will not reach a temperature of 1,058 during a half-an-hour fire. And that is one of our regulatory limits. In this particular case the fuel cladding exceeded 1,058 at 116 hours into our fire analysis for a 20 meter case.

And of course obviously if you move closer to the fire source, you are going to heat up faster. Now one thing to note down here is that it took 10 hours for the fuel to even change temperature; 10 hours of an exposure for the fuel to even start to increase in temperature, and the fuel cladding is what I am talking about.

And so for this particular case, the fuel exceeds 1,058 at 37 hours. Now, a lot of people will say, okay, so if you have a fire that is longer than 37 hours, does that mean that your fuel will fail and that you will have a release.

Well, there are a few things to keep in

mind here. The temperature is a regulatory limit, and is by no means the temperature at which the fuel will fall apart.

In other words once you reach 1,059 the fuel cladding explodes. It is not like that. It is an experimental limit where they actually took fuel cladding and exposed it to a temperature of 1,058 for 30 days and for 70 days, and they did not see any degradation or any failure of that fuel cladding.

And so the NRC feels that is a fairly conservative limit to say that you have got to stay under that limit for the short term temperature limit.

All right. This is another animation, and this is that model that I showed you before, and I am going to show you an animation of what happens when I put it in the conditions from the Howard Street tunnel fire.

This is an animation of five meters away from the fire, and so it is going to heat up fairly quickly. As you can see the maximum temperature actually for now is right around the top of the task, which corresponds to the fact that the ceiling is heating up first.

The fire was shooting up right between those cars and hitting with an impact in the ceiling, and you have that hot gas load developing, and you will see the temperature contours -- the yellow, the orange, the green, and it starts to move down into the body of the cask.

The other thing I noticed here is the top of the cradle support, it is heating up a little bit, too, because the way that we made this model, we figured that as it is five meters away from the fire, the fire is coming up over the impact limiters, and that fire has a direct view of the top of this cradle, and so it is going to start to heat that up as well.

And as you can see, we are still going. Well, actually I think we are down now. Anyway, the maximum temperature is up here at the top of the cask, and it decreases at it goes down to the bottom. And you have a relatively cool region down here for the cask model.

So just to recap some of the results that we had, the time to exceed the short term fuel temperature limit of 1,058, for 20 meters, it was over a hundred hours.

For 5 meters, it was over 30 hours; and one of the things that we also wanted to look at was the multipurpose canister, because you could fail the fuel rod in that canister, and if that canister is not breached, you will not have a release to the environment.

So we looked at the canister and said with this kind of an exposure would it fail and would you have a breach based on stress or stresses. And as you can see, for 20 meters, it would take over 30 years at that sustained peak temperature for that canister to fail from stress. And at 5 years it was about the same. There really wasn't much of a difference.

Some conclusions. Honestly, from this kind of an analysis, we feel that we have captured the physics of what was happening, and the reason why I say the physics, is that obviously phenomenon fire, and materials, and the way that they behave when they are in fire, are governed by natural laws.

And some of you may have had physics in high school, and if they are governed, the behavior is governed by natural laws. If you can take those natural laws, and put them into a computer code and simulate, and use those natural laws to simulate how a material is going to react, or how a fire is going to act.

You can actually catch and you can determine what is going to happen, and in this case we looked at the cask, and we know what the materials are in the cask, and we modeled those materials, and we modeled the behavior materials, and we put it in a fire environment, the Howard Street tunnel environment.

And we feel that we have captured what would have happened if it had been in that environment based on the physics, the natural laws that are involved here and what is actually going on.

So for this particular canister, a spent fuel transportation cask design, and the exposure of this cask to the Baltimore tunnel fire event would not result in a radioactive release. And we believe that the health and safety of the public wold be protected if this particular cask design had been involved in this kind of accident.

Implications for PPS thermal testing. That is what we are here to discuss. In this particular case, if you take a fully engulfing fire as was proposed in the PPS, and you -- and one of the big discussions going on here are duration.

It is very possible that for an extended duration beyond 30 minutes the thermal input to a cask in a fully engulfing fire test could be as worse or greater than the exposure that we calculated in the Baltimore tunnel fire event, and that's all that I have.

FACILITATOR CAMERON: Okay. Thank you very much, Chris. And we realize that the Baltimore tunnel fire is interesting and important in its own right, and we would like to try to keep on the fire issues for the test, and to tie the Baltimore tunnel issues in with that.

But let's see. It looks to me that people have comments or questions on the Baltimore tunnel fire, and so go ahead, Bill.

MR. BRACH: This is Bill Brach. I just have just one what I will call administrative comment. Kalynda pointed out to me that on page 4 of the hard copies that were distributed that the X and Y axis were not identified. This is the profile that showed the NIST temperature data, and I believe on the X axis I believe that was distance, and I believe we had temperature on the Y axis.

So for some reason when copies were made all of the overheads, it appears that for some reason, or at least on this one version, and it seems like on Jim's also, the measured distance and temperature ordinance were left off. So that is on page 4. If you could put that up again, Chris, for just a second.

FACILITATOR CAMERON: Thank you, Kalynda.

MR. BAJWA: Probably the reason that it

didn't show up was I wanted to make sure that it would be visible up here on the screen, and that did not translate well into the copies, and so I apologize for that.

FACILITATOR CAMERON: And, Chris, you can either stay up there or -- well, we will see how far we get with this. Bob, do you want to start off on the Baltimore tunnel fire.

MR. HALSTEAD: Yes. I certainly appreciate the opportunity to make some comments today. I am very sad that Chris started off his discussion by referring to facts, and fiction, and truth, and untruth, because this is exactly the kind of a situation where what many of us would consider truth may never be known.

It certainly is the kind of a case where as Dr. Bonnie called for thorough peer review this morning, we need thorough peer review of these findings.

Let me tell you the difficulties that the State of Nevada has had in dealing with the NRC study of the Baltimore fire. But first I want to give you my conclusion. Nothing I have heard in Chris' presentation -- and this is the third time that I have heard it. It is a very good presentation, and the fire is great.

But nothing that I have heard in Chris' presentation and nothing that I have read in the NIST report done for the NRC on the Baltimore fire in any way alters the conclusions in the paper that Fred and I authored for waste management, nor does it alter the conclusions of the study that Resacoff and Lamb did for us in September of 2001.

Nor does it address the issues in a report that we will be submitting. I must tell you that we were going to keep this dicey stuff for litigation, but I suppose we will put it in the hopper here.

An analysis by Dr. Myles Griner of the Mechanical Engineering Department, who is by the way one of the technical advisors to Sandia on the report, where there are performance envelope analyses of cask performance in fires, which I think just draw totally different conclusions from what Chris has drawn.

In July of last year, Wayne Hodges of the Spent Fuel Office, denied our expert, Dr. Merritt Berkey, with 37 years of experience, as the NTSB's chief fire investigator, and before that a fire investigator for NIST, and Dr. Berkey was denied the opportunity to sit in during the meetings that the NRC had.

And frankly, Bill, I don't know what your legal authority for that is, but we are certainly researching it. Secondly, you will note from the title page of the NIST report that the publication was completed in August, and I got my copy February 10th, and I don't know when others got theirs.

And, thirdly, we were therefore forced to file a Freedom of Information Act request, which to date we have spent between $1,500 and $2,000 on more or less meaningless photocopying, because you know on a FOIA, it is easy for an agency that doesn't want to give you their information to send you all kinds of meaningless documents.

And frankly, all the substantive issues aside, I cannot for the life of me come up with a good reason for why you would treat us like this and then come to a meeting and want to talk about public confidence.

Now, about the specific issues in the NIST report. The first problem is that we think there is a bias in the way that the NRC approached this report. They did not start out to do an objective investigation of the fire.

They set out to see if they could defend their fire standard. Everything that we have seen in our interactions with them suggests that to us. And the way to resolve this is you can set up a meeting with us, and I have not heard anything from you about this, but we have asked you to bring the authors of the NIST report to one of these meetings, and we will bring our experts in, and we will go over these issues.

Secondly, the most important issue for testing is to see what was the worst case fire that could have occurred in the Howard Street tunnel. Now, we have told you about all other kinds of horrific accidents, and those 21 that I keep mentioning that you have not responded to.

And I don't see anything to change my conclusion that a 24 hour fire at over 500 degrees fahrenheit, or a 12 hour fire at over 1,500 degrees, or 800 degrees, is a reasonable fire.

And there are all kinds of complicated fire issues which I am not going to bore you with, but I am going to outline them at the end here. But going into this discussion of what constitutes a worst case fire, the Baltimore fire is useful, but it is not the end-all.

Point 3. For testing of a cask the issue is what is the most vulnerable combination of cask and fire configurations that could have occurred in that fire, and frankly we think you got great performance out of that welded canister.

And that's why we think you probably ought to require it. A traditional steel-ledge steel cask, certainly a truck cask, would have failed in that fire.

The fourth point is that the key fire condition issue is what if there had not been the intrusion of the water from the burst water main which cuts off the hottest part of the fire in 3 hours.

And Chris and I have debated this before, and Chris thinks the longest duration of the fire could have been 7 hours, and we think it could have been greater than that, but there is no doubt in their report that it says 3 hours at a thousand degrees c. is a reasonable duration and temperature combination.

Point 5, and this has several subpoints to go to the questioning of the methodology that Dr. Berkey prepared for us. First of all, and without belaboring it here, we want an explanation of why you think the fire reached a steady state in 30 minutes, and some alternative values are possible.

Secondly, we would have liked to have seen the tunnel simulation run for at least 3 hours instead of the 30 minutes.

The third subpoint, and this analysis may be most important, it does not to us appear to include the reradiation of the heat that is absorbed by the brick wall of the tunnel during the hottest part of the fire.

Now, it is difficult to calculate exactly what that means for the fire environment, but at a minimum you have got 3 hours at a thousand degrees c. And then you have got a larger fire of 7 hours at 800 degrees c., with a 3 hour spike at a high temperature.

Also, because of the reradiation of the heat from the tunnel wall, and because you have got paper burning probably around 500 degrees fahrenheit, you have got both an extension of that thermal environment in the tunnel; and beyond that, because the fire is burning and the firefighters can't get in there, you have got an extended period of cool-down, and that is cool-down after the cask has reached its maximum temperature.

So for all of those reasons, we don't think you have shown us very much about the Baltimore fire, and we think that you chose a cask that had exceedingly good fire performance. We are not sure that we can agree with your analysis.

And the bottom line is here is where you need to have rigorous peer review. So we would love to have a blood bath. Bring your people to the room, and we will bring our people to the room, and let's see what they conclude.

Now, I really don't want to do that. What I really want to do is bring some reason to this discussion of setting a target for a failure analysis, and certainly it seems to us that 3 hours at a thousand degrees c. is one fire duration temperature combination that can be drawn from this study.

And it is also possible that somewhere between 7 and 12 hours at 800 degree c., with a 3 hour spike, at a thousand degrees, is very important, and are reasonable fire parameters.

And I want to conclude by saying that I like Chris very much, and I am impressed by the elegance of his analysis, but I am very saddened by the institutional relationship that has been poisoned.

And, you know, these are things that -- you guys are real nice in this proceeding, and then we keep having these horrific interactions with your technical people.

And for the life of me, I can't figure out what is going through their mind. In particular, to sit on that report -- and now maybe you were doing some reviews, but it tells me that the manuscript was finished in August, and here we are going through FOIA to see what documents we want photocopied, and not having been honestly told that the report is completed and being withheld. It doesn't look very good to me.

FACILITATOR CAMERON: Bob, thank you for those comments, and maybe this meeting that the staff wants to have belatedly, you can work out some of these issues so that we can get past that poisoning of the relationship.

MR. HALSTEAD: There is a final irony here. The NTSB is so confused about their analysis of the Baltimore fire that last seek when I wanted to bring -- and in fact we had Dr. Berkey at the meeting, and we wanted to put him up to give a little bit of critique, and we heard that morning that the NTSB was so concerned about their inability to conclude their investigation of the Baltimore fire that they had written a contract for Dr. Berkey, who had retired a few months earlier, and asked him to come back.

And there is a clear potential conflict of interest on the Baltimore fire issue. Now, he may be able to be our representative on designing the thermal test protocols, but the conclusion is that a couple of months of employment as a consultant for the State of Nevada critiquing government agencies makes him very saleable. And for those of you with some career plans, you might want to think about that.

FACILITATOR CAMERON: Okay. Thanks, Bob.

MR. BAJWA: Chip, I just have to say a couple of things. Obviously Bob and I have a difference of opinion on this, and some of the things -- and in fact all of the things that Bob has said I think we can work through in a face-to-face meeting.

The experts who put together the NIST report for us are fully willing to sit down and talk about this with Bob and anyone whom he would like to invite. So we have made that offer before, and we will stick to that.

MR. HALSTEAD: If you had made that offer before, I would have accepted it. I heard it today for the first time, Chris.

MR. BAJWA: I believe we discussed it at our last meeting, but actually I believe, Bob, that you were the first one to suggest it.

MR. HALSTEAD: Yes, I did.

MR. BAJWA: Okay. You were the first one to suggest it, and I had decided before you suggested it that it would be a good idea, but you were the first one to suggest it.

Let me just explain. What I mean is that we were open to do that, and Bob suggested it, and I quickly agreed. Would you agree with that?

MR. HALSTEAD: Yes, and I think that the sooner we get -- but what I am going to do is not miss the point here, because we will never know what would have happened in the Baltimore tunnel, and the important thing is to come up with a good fire test protocol.

FACILITATOR CAMERON: Right.

MR. HALSTEAD: Can we agree on that?

MR. BAJWA: Absolutely. That is what we are here to do. That is what we are here to do.

FACILITATOR CAMERON: And so let's have a final comment on this part of it. I am not talking bout the rest of you. But I think that Bill wants to try and clear the air a little bit. So, go ahead.

MR. BRACH: Hopefully clear the air. Bob, you have made a number of comments and many of them are right on the mark. We had been talking earlier today or actually quite a bit of the day about public confidence, and public trust, and the comments that you have made clearly indicate that from a pass practice, lessons learned, we still have a lot to learn.

And I apologize and recognize that, and I just want to make a few comments. One, the contracts that we have had -- and Chris has summarized it, but with Patel Pacific Northwest Labs to assist us in this review, and the National Institute of Standards Technology, and those are contracts that the NRC had with individual entities or parties, to assist us in carrying out the review.

Meetings between the NRC and our contractors in these activities are not public meetings. They are not traditional at all public meetings. The interactions between us and the contractors involve everything from the work that they are doing, and the status of the work, and aspects of financial arrangements as well.

And I say that, because the meetings that you have mentioned were not public meetings, and you or your representatives were not specifically excluded, while other members of the public if you will were allowed. Those were not meetings of that nature.

But rather than trying to dwell on that, I think what I really want to do is go back to the point that you stressed with regard to efforts on our part to build confidence and to build trust by what we do and not by what we say.

And I think that the point that you made, comments were offered, and one I have heard, and I think we all collectively here understand and recognize where we are and where we need to be, and establishing and building that trust and confidence.

And the last comment is that both Amy has mentioned and Chris has mentioned that we did discuss briefly last Thursday at the first workshop up in Rockville, and that is the agreement suggesting -- and I am not going to get into the territory of who suggested or thought of it first.

But from the standpoint of having the folks from NIST and Patel Pacific Northwest Labs, and our staff, and Bob, folks that you had mentioned affiliated with the State, to sit down and walk through what we did, and the basis of what we did, and the modeling, and the assumptions that we used.

And hopefully we can come to a technical understanding. I don't want to reach too far and say technical agreement, but a technical understanding of the approach and the conclusion -- the approach that we took and the basis for the conclusions that we have reached in the study.

FACILITATOR CAMERON: Okay. Great. Kalynda, and then we will go over to Mike.

MS. TILGES: Thank you. I have a question and a comment relating to this, and then I have a process question.

FACILITATOR CAMERON: All right.

MS. TILGES: First of all, my comment is just to say that face to face is great. You know, it seems to me, and again I have to go back to comparisons with the Department of Energy.

Whenever we get into these kind of head-butting situations, they always want to have face to face meetings. Well, I think we need public meetings. I don't want face to face meetings where just a couple of people know the information, and then maybe it is filtered to the public.

That is what I was talking about if you are talking about confidence and trust. I am talking about complete openness and transparency in every step of this process. And not just within the agency, but to the public.

You can't expect confidence and trust from the public if you are not willing to trust them and be confident in them yourselves. My question related to this is with the combined heat from the inside of the cask, because we are looking at built high heat from radioactive spent fuel, the combined heat from the inside of the cask, and the heat from the outside of the cask taken into consideration.

And I will let you answer that first, and then I will ask my process question.

MR. BAJWA: Okay. Yes, we had a heat load of 20 kilowatts inside the cask.

MS. TILGES: Could you put that in layman's terms?

MR. BAJWA: Okay. That is the maximum that is allowed for that design.

MS. TILGES: Which was -- can you give it in fahrenheit?

MR. BAJWA: It is not a temperature. It is a heat flux coming off of the fuel. For this particular design, it was a design basis fuel. In other words, they could not load anything hotter than 20 kilowatts in that particular cask design.
So we took the worst case.

MS. TILGES: So again, does any member of the public here understand what he just said?

FACILITATOR CAMERON: Let's see if we can get a clarification of that and then we are going to have to move on. I mean, we will see if there is an easy way to explain it. Chris, can you try? Can you try to do a brief one for us, Carlos? And please introduce yourself.

MR. LOPEZ: Carlos Lopez, Sandia National

Labs. If you can relate watts by thinking of a light bulb, and that you use for your house, usually a 60 watt light bulb, and if it is on for maybe even 3 to 5 minutes, you can hardly touch it. It would burn your hand a little bit.

And so when he had said 20 kilowatts, it is 20,000 watts, as compared to 60 watts of a light bulb.

MS. TILGES: Well, I understand the difference between watts and kilowatts. What I want to know is how hot was it in temperature terms, so that everyone here can understand that who doesn't have the ability to work for Sandia.

MR. LOPEZ: I am not sure if that kind of data is available here, but what you do is -- and like he mentioned before, you run a steady state of analysis, where you have the heat load distributing over the cask, and there is a point where the cask is transferring heat to the environment, and the so-called (inaudible) transfer, which is part of the regulations, as well as the package vendors are required to look at the normal condition of transport by what is called a temperature distribution.

And where you usually have hotter temperatures in the middle of the cask, and cooler in the other places of the cask, or the surface of the cask, and then after you reach that stage condition, then you do the fire test.

Now, I am not sure if Sandia has the data here available to tell you the exact temperatures, but I am just going to guess that the outer surface of the cask may be somewhere around 80 degrees c., which may be --

MS. TILGES: What I asked for was the temperature of the inside of the cask.

MR. LOPEZ: I don't have that data.

MS. TILGES: Okay. So we answered that question, which is that nobody knows, or is willing to tell us.

MR. LOPEZ: No, we know.

MS. TILGES: Well, can I get that figure, please.

FACILITATOR CAMERON: Go ahead.

MR. BAJWA: The result figure that we had in the handouts, that shows the temperature of the inside of the cask during that transient, and the heat up of that cask in the fire.

If it is not clear on your handout, I will show you that graph on the computer, and it is very clear.

FACILITATOR CAMERON: Okay. Let's go to your process question.

MR. LOPEZ: Okay. The answer is 700 degrees fahrenheit in the middle of the cask, and 200 degrees fahrenheit on the outer wall where you can touch, which is somewhere around 80 to 100 degrees c. like I mentioned before.

MS. TILGES: I thank you for the final answer. However, that round and round, I simply am more confused than I was in the beginning, but thanks for trying. The important thing now is the process question.

We are now at 10 past 5:00 and the original agenda that went out called for a public comment period from 5:00 to 7:00, and indeed that is what the grass roots organizations put out to their constituents for the public to show up from 5:00 to 7:00.

We are seriously behind schedule, and I think the public deserves to know if they are going to be able to make comments, and if so, what time and how long this meeting will go on. Personally, I am prepared to stay until the cows come home. Thank you.

FACILITATOR CAMERON: Now, let's be specific. What time is that?

(Laughter.)

MS. TILGES: Until we get through the entire agenda and all the public has had a chance to comment.

FACILITATOR CAMERON: Now, we are going to go out to hear comments from the public, and we are very sorry that the agenda switched, and that was a mistake. And we do want to get comments from this panel on these fire issues, and as soon as we are done with that, we will go out and see if anybody has comment.

So let's say that we run until to quarter-to-six with this particular discussion, and then we will go out to the public, and we will assess where we think we are with getting input on this fire issue, okay? So let's go to Mike.

MR. BAUGHMAN: Chip, I guess I have a question. Looking at the PPS, it appears as though that the rail casks, that the analysis for the fire scenario, whether it is 1.3 meters or 3 meters, or whatever, does not include rail time.

In fact, for your truck scenarios as well, it appears as though in all of our scenarios the cask has become detached from its transport vehicle, and I am wondering first of all why we are assuming that, and it appears to me as though the transport vehicle itself, the rail car or the trailer that the cask sits on a truck represents shielding that is not being considered here, whether it is impact or fire.

And it seems to me that if the assumption is that, well, if it gets in a wreck that it is going to fall off, and so we have to model it that way, why aren't we figuring out how to keep it on that thing if that does provide some measure of shielding.

And why aren't we considering that shielding in the analysis.

FACILITATOR CAMERON: How about an answer to that?

MR. SORENSON: Well, you are absolutely right, Mike. It does not include any of the conveyance, the trailer, or anything like that, and typically looking at the performance of these casks in these accident environments, we really do try to look at what is the response of the cask itself.

And that primary containment boundary that John was talking about to these very severe environments. You are right. You do get shielded from the conveyance, but there are different designs out there and different scenarios, and so I think the NRC really looks to rely on the cask containment boundary itself to provide that protection and safety.

MR. BAUGHMAN: Well, for the impact test, which I appreciate that we are not there yet, but the weight of that trailer, for example, when that cask crushes that highway pillar or whatever, has that been factored into the analysis?

I mean, we are not including that then. So I think that there is a flaw in not factoring in these transportation -- you know, the trailers and the rail cars.

DR. MURPHY: I a not sure it is a flaw, but a decision that was made, because that is what went into the proposal, and we had to make some decisions. Our interests was to show that we could get the behavior of the cask as a unit, and to be able to get that correct.

And as we talked about with the unyielding surface, we could do the unyielding surface, but (inaudible), and as a seismologist, I know looking at non-linear ground behavior when that ground behavior is of granite, or of sand, is very difficult.

We are looking at a program -- and I don't want to say that we decided on the things, or we proposed the things that we think we can handle at this time, and the things that are critical to behavior in the performance of the cask.

If we can get these right, then those represent -- I will say -- the conservative. We would have known that for a fire that the conveyance, whether it is a truck or a rail car, would in some sense protect, and act as an insulator between the fuel and the cask.

So that if we can do the cask simply exposed to the fire or to the fuel, and if we can get that right, then we can show that and there are no surprises, and we won't have to go back and rewrite our regulations. We have done our job for that.

Then if there are scenarios that come up and we need to examine, or want to examine, we can take a look at what the effect of the conveyance might be on the performance of the cask.

Like I said, we are trying to eat an elephant one bite at a time, and if we can get, and I think we can, we can get the performance of the cask right, the other things will come along later as necessary.

FACILITATOR CAMERON: Thank you. Is that an acceptable explanation? Do you have any questions about that?

MR. BAUGHMAN: It is. I think that is a

great explanation for the rail car. I am a little more concerned about the cask and the impact, and just the added weight of the truck and all that.

FACILITATOR CAMERON: All right. Let's go to Judy, and then Diane.

MS. TREICHEL: I wanted to know if during that Baltimore experience did any of the cars tip over in the tunnel?

FACILITATOR CAMERON: Chris.

MR. BAJWA: No, the tunnel itself was not large enough to allow any of the cars to tip over, especially the rail cars that were -- the large, tall rectangular cars. The Tripropylene tanker car was on its side due to the derailment, but it was not able to fully tip over. It was at an angle.

And again because of the geometry of that tunnel, the size of the tunnel, would not let it fully go on its side.

MS. TREICHEL: Okay. And then it showed that there was a whole in the tanker car. Do you know what caused that and what would it have done had that been a cask and hit in the middle and not on the impact limiter?

MR. BAJWA: First of all, the brake mechanism of that particular car because dislodged during the derailment, and it swung up and it hit the tanker or the tank car, sorry, and punched a hole inside it. We did not look at what a brake mechanism would do to a cask, but the break mechanism on a cask, or I'm sorry, on a rail car used to transport a cask is very different than what is used on a tank car.

So we have not looked at that and we don't know if it would do the same kind of damage. We doubt that it would.

MS. TREICHEL: Thank you.

FACILITATOR CAMERON: Okay. Thanks, Chris. John.

MR. KESSLER: I wanted to get back to the previous discussion about whether you include the trailer or not, and would you include the effects of the soft ground versus these unyielding surfaces. I guess the concern that I have is that we seem to be putting the cart before the horse, in the sense that until all of these analyses, in terms of what are the risks or the effects of something more real world, in terms of what did those cause in terms of potential damage.

And I am not sure that we an -- well, it is not so clear why what is being proposed is relevant, and I just wanted to point out that this discussion about what mitigating effects might the trailer on a truck or the flatbed might have, and what does real ground act like in terms of how much energy it absorbs.

And then how do you relate that back to how hard do you really have to hit this thing in some sort of realistic set of circumstances, and how likely is that, are all things that I would like to see flushed out more before you say go with this and have a good justification for it.

FACILITATOR CAMERON: In other words, apart from the issue that Mike brought up, there is still a lot of unanswered questions in regard to the protocol itself.

MR. KESSLER: Right. And if you look at -- and let's say that they are proposing 75 miles an hour, and people could say, yeah, 75 miles an hour, we have speed limits like that, and that sounds good.

At 75 miles an hour on an unyielding surface, and then what does that mean, and how often do we have the equivalent, and I know that Andy is talking about simplifying things, because this is a tough question to answer.

But I think that all of us would like to have some feel for what that means. How likely is it that we have the equivalent of those kinds of conditions, and what do we have statistics out there?

I know that it can be at least approached in terms of an answer. The other thing that I think would be useful is some sort of discussion about how safe is safe. I think that this is one of the problems that we are having here, is that some people have one concept of safe, which means that I may be misinterpreting some of Bob's comments about I can name 23 accidents that are worse.

And the idea is that safe -- or my understanding is that the NRC feels that safe is you have got the vast, vast majority of cases covered. You have confidence that the probability of an accident resulting in some sort of health effect is very, very low, and that governs what you are proposing in PPS, and it governs your regulations, and everything there.

And what we need to talk about is bringing things back into that risk informed space, which the NRC is trying to be in here. And you have got to look at the realistic conditions and get some sort of estimate as to how often is that going to occur, and how many of these extreme cases are we going to try and cover.

FACILITATOR CAMERON: Do you feel that since we are discussing fire here, do you think that there is not enough information presented in the fire part of the protocol to really make any good judgments in regard to risk informed --

MR. KESSLER: I think it would be useful if you are going to present a particular fire protocol that you try to put risk information in it. When I read what was in the report, what it boiled down to in the end was that we are going to run this thing until it fails, because we want to see what failure looks like.

Okay. If you clear out that that is what your real goal is, that's fine. I am just suggesting that let's try to make it some sort of touch on reality. I mean, what are we talking about in terms of different kinds of conditions that could possibly lead to what you did in this test that caused this thing to fail, and continue to heat the thing until something fails.

FACILITATOR CAMERON: Okay. I would be interested in reactions to that. Andy, did you want to clarify something and then we will go to Diane.

DR. MURPHY: I wanted to come back to a particular point, and that is that in the protocols itself, we talk about the impact, which is later on today, and we selected the 75 miles an hour.

And for that particular test, we went back in and had Sandia look at the statistics that are already available, and I hate to say it, but from 6672, and that is going to bring up another topic, and that gave us using those numbers -- and we put them there in black and white.

And they show that the probability of the frequency with which the 75 miles an hour accident would occur into a granite surface, a hard rock surface, about 10 to the minus 7.

And we have not done those calculations and looked at that information specifically for fire yet. It was our intent to put that Appendix A in there to indicate how we would be looking at those decisions.

So that in the final detailed test plan, and if the fire test lasts, and we have it in the program, and it has not changed so dramatically, we will take a look at the statistics of how often that particular fire would occur or has occurred in the past.

And that would be included in the package and in the document describing the detailed tests. So it is our intent to take that information into account when we make the decisions about what the test is going to be.

FACILITATOR CAMERON: All right. Let's go to Diane, and Fred, and then Bob.

MS. NIELSON: Just some input on what I would like to see in terms of the fire test and get us back to that point. I would like to see the test run with the cask on a support rail car and road transport, and off, if you believe that the cask can become detached from the transport in an accident.

And I want to see what happens if you have been impacted first when it has been crashed first and rendered -- well, I want to know what the difference is -- and I don't know what temperature to give you, but something that exceeds the standards, or the regulatory standards that you are using for certification now.

And for a situation where the shielding has been compromised and where the containment has been compromised. So if we have got a crash where that has occurred, and I want to understand the difference when you have got that within a containment that looks like a tunnel, or acts like a tunnel pulling air through, as opposed to an open air situation.

FACILITATOR CAMERON: Diane, thank you for the suggestions. Fred.

MR. DILGER: Two things. First, to go back to Mike Baughman's point a little bit. The consensus that came out from last week's meeting in Washington from the cask designers and the cask testers, and the guys with a lot of experience doing this, is that to attach the cask to a carriage would be to essentially add an impact limiter to it.

And that it would behave like an impact limiter, and the suggestion was made that it would give really good visuals for the public confidence area, and I think that was discarded at last week's meeting, because it was agreed that by simply testing the cask without the additional limiter of the carriage that you had a tougher test.

So if we test these without a carriage hook to it, we miss the visual, but we get a tougher test. And I think the tougher test is better. The second thing is that I think that John has made a very good case for regulatory testing.

And I think that the arguments about how probable accidents are and how likely they are, and all of the other probablistic issues out there don't need to be addressed when we merely do what our existing regulations call for.

And I would like and I would advocate that once again after we do the regulatory testing, we don't need to get into the arguments about how good or bad

6672 is, and that we do not need to get into a lot of probablistic risk analysis, and that we can rely on those regulations, which admittedly model a very, very serious accident.

FACILITATOR CAMERON: Thank you, Fred. Bob.

MR. HALSTEAD: Well, as the hour is late, I think the more charitable thing that we can say about the fire section of the testing protocols is that it is not acceptable. It is not a basis for making any decisions for a whole lot of reasons.

Some of the issues that Mike has raised -- I mean, they are just amazingly a large number of configurations of how the car or tanker could be in the tunnel and in fact if the cask is on the rail car and higher, then it is closer to the ceiling of the tunnel where the greatest irradiation of the heat is occurring.

So what it does is that it tells you about the complexity of modeling what you want to do in the test, and let's make it clear. We are not advocating doing any extra regulatory testing without modeling, and what it is that we are going to simply get out of it, and I think that is a waste of time, although I agree with Fred that we are probably safer sticking with the regulatory temperature of the fire, and then varying the duration of that.

But the long and the short of it is that we have not even talked about pool fires, and Carlos has got lots to say about pool fires, and pipeline fires, and Myles Griner did some analysis for us, and talked about the fact that the engulfing fire may not be the hottest fire.

That in fact in a wind-driven fire that the impingement of it at the windward side of the fire may in fact lead to a short duration, but extremely high temperature, fire. And depending on the configuration of the wind to that fire, you may get a whole lot of other fire issues that you may want to look at.

What we say is this. We think that the fire test is the most important regulatory test,partly because of our concern about the seals on the cask, and partly because of our concern about the radiological consequences is, does the radioactive cesium get out of the cask. Is there a clear pathway, and then by god is there a fire that has got a plume with particles in it being carried downwind.

So I hate to say this, but you have got a real problem here with the difference in the acceptability of the extra regulatory impact and fire analysis, and I am going to defer arguing with you about the impact stuff.

And I think the only way I can see us agreeing with this is that you are going to have to go back and redo your fire analysis and maybe you are going to have to come back and talk to people about it again. I don't see any other way to resolve these issues. Thank you.

FACILITATOR CAMERON: Staff, you have heard comments about -- Bob termed it unacceptable, and he has given some reasons. John was talking about how there needs to be more types of information in there.

Do you have any -- and I have not heard -- and of course Diane requested that there be some other questions and situations looked at. Is there anything that you need to know that you want to ask people around the table, in terms of revising the draft test protocol?

And I guess I should ask if there is any people around the table who feel that the draft test protocol is great just like it is, and give the reasons for that? Any questions that you want to ask the group?

MR. BRACH: I just wanted to add that the purpose of this meeting is on our part not to be making decisions, and is to listen to comments and clearly, Bob, I heard your concluding comments with regard to the fire test consideration parameters, but from the standpoint of the comments that were offered and Diane's comments earlier had a number of different considerations for tests, and test arrangements.

From my perspective the purpose of the meeting is for us to hear these suggestions and comments, and if you will the why behind those suggestions and comments, and I don't have any further questions, but as Bob suggested, there may be quite a bit of work on our part as we look at the fire test, and planning for the fire test and conditions, to help us reach final recommendations and decisions.

FACILITATOR CAMERON: Okay. Let's go to Kalynda and then we will go to Jim Channell. Kalynda.

MS. TILGES: I just wanted to state Shundahai's position on the fire test, and the orientation. And after my last question, I think it is probably not necessary to remind everyone that I am not a scientist, and so I will make this simple; is that Shundahai feels that as far as the heat the cask should be tested with the hottest burning substance on our Nation's rails and roads.

I don't know if it is jet fuel, and I don't know if it is diesel fuel. I don't know what it is. But the hottest burning substance that is allowed to travel on the Nation's rails and roads, that is what should be used.

It should be a fully engulfing fire, and we would also like to see concentrated flame on known unperceived weak spots, such as the lids and the hinges. I mean, the welds. Excuse me. Anyplace where it connects.

FACILITATOR CAMERON: And when you say concentrated, is that what people -- like the torch?

MS. TILGES: Like a torch test, but again I don't want to just say that and let it go. I am talking about the highest temperatures that could ever possibly hit it. I don't know how you do that with a torch test. You have got a lot of scientists to figure that out.

But to me if it is not being tested with the hottest fuel and it is not being tested in the specific weak spots or perceived weak spots, then you don't have an accurate test and you don't have accurate results.

FACILITATOR CAMERON: Okay. Thanks, Kalynda. Jim.

MR. CHANNELL: I think the fire test probably needs more work. For one thing, there is still an uncertainty about how long you want to go with this. A couple of concerns that I have right now, one of them is tied in with my earlier concerns about doing the full-scale hypothetical accident condition test, is that you would do a regulatory fire test to be sure that your cask will pass that test, and then you need to do this extra regulatory test on whatever you decide to do.

Now, you cannot do this at the same time. You might be able to do it later with the same cask. I don't know why you couldn't. But I think that these are two different things, because if you do the extra regulatory test and you get some seal failure, which you would expect to get, you still can't go back and say, oh, well, it would have passed the regulatory test unless you checked it.

FACILITATOR CAMERON: Okay. Thank you, Jim. Other comments on the fire issues, optically dense, and then we are going to go out to the audience. Anybody around the table want to offer anything? Andy.

DR. MURPHY: Just a quick comment to maybe make my job a bit easier. If you can provide the specificity in your comments like Kalynda just did, and what you see as bad or unacceptable, and needs to be improved, that information as I said will make my job a whole lot easier in addressing your comments and concerns.

FACILITATOR CAMERON: Okay. And, Peggy.

MS. JOHNSON: Citizen Alert will have comments to the NRC before May 30th, and you know, I have been in a lot of meetings where people say, well, why -- well, we really want your input and we are really going to listen to you.

I want to make sure that you are really listening to us, and I want to make sure that when we give comments and when we give suggestions, if it is not working out for you, or there is reasons why you don't think it is going to work, I want to have somebody communicate that to me so that I know that you actually did listen. Thanks.

FACILITATOR CAMERON: That is obviously an important point and the staff is considering the best way to indicate that it did listen to people. Go ahead

MS. JOHNSON: Well, I want to say that has not happened in the past, and that is why I am raising it.

FACILITATOR CAMERON: Okay. Thank you.

Okay. Comments or questions from the audience on this? Oh, I'm sorry, and please introduce yourself.

MR. ZABARTE: My name doesn't matter, and I am Western Shoshone and my name is Ian. And it is too complicated to explain who I may be representing, and so I am not representing anybody.

But I want to suggest that risk and probabilities, and impacts, are subjective in terms of the Western Shoshone. We are not affected in the same way that the non-native community is, and those impacts may be much deeper.

And the way that we respond to these situations may be uncharacteristic of what people would expect. We use different heuristics to determine what our approach to the problems are.

And I guess what I am getting to is how can you assure public confidence and know that you are meeting the needs of the particular community? How do you communicate that?

I really don't have confidence and I didn't get an invitation. I probably got a notice, but I get a lot of mail anyway. The point is how do you expect to achieve confidence from native communities, and specifically since they are on rail routes and highway routes.

And I think that is about it. And, oh, I have a good scenario, too. Near my community, there is an oil refinery right on the turn, and I can imagine that truck going straight into those tankers and then setting off the 25 oil wells in the valley on fire. How do you respond if it can't take the heat?

FACILITATOR CAMERON: So to speak, and that is similar to the special case in Nevada that Bob talked bout earlier about the aircraft overflight. How do you take into account those special situations.

And I think that you are reinforcing what we heard from John, and Bonnie, and Calvin this morning about the special circumstances of the Native American communities. So, thank you, Ian. And it is something that the staff is going to have to address. Any other questions? Yes.

BROTHER MUIR: My name is Brother David Muir (phonetic) and I am a member of the Franciscan community here in Las Vegas. Our Franciscan community has been here since the late 1960s, 1968, and I have been here myself for the last 6 years, but we have had Franciscan sisters, and brothers, and priests, who have lived here and been very concerned, and understand very well the horror of radiation.

And so we come from a very deep place in this work. Sister Rosemary and Sister Clorita, who I know Judy has worked with before in the past, back in the late '70s came out and they moved to Las Vegas, and they discovered the study of the downwinders in Utah.

And they started collecting stories of those people. If you talk to people in Japan who have experienced the nuclear bomb dropped down upon them, they are very anti-nuclear. They know the horrors of it.

This community of Nevada understands the horrors of radiation. So you should expect to get a more stronger critique, and more challenged, and it is kind of disconcerting for me to hear our representative from Nevada on how he has been treated in this process.

I mean, he is representing people from our State who have a deep history and a deep concern, and I would hope that the authorities on the Federal level and from other States would take to heart the concerns of our representative here.

So I am glad to hear of these upcoming face-to-face meetings, and the hope and the concerns of many of us is that they are not just public relations show, which maybe has been the case in the past sometimes.

That there really will be dialogue, and

listening to the public's concerns. So for those of you who are not from Nevada, I hope that you take to heart the extra concern of the people of Nevada, and our neighbors in Utah, too.

We have worked with downwinders, like Claudia Petersen and Sean Charge (phonetic), and we have worked with Terry Tempest Williams in Salt Lake City. We have had actions out at the Nevada Test Site, and some of our friars have been arrested for non-violent protest at the Nevada Test Site because we come from a deep place.

We know maybe more deeply the horrors that can await our human beings that we live with here, and this is a very serious issue. So if we ask for stronger casks, it is coming from some of that personal experience and knowing people who have died and suffered with exposure to radiation, and we maybe know better than most of the rest of the country of that potential horror.

So we ask that all casks be tested and explore the failure limits. At what point does the cask no longer hold the material, and we hope for a testing program that is meaningful.

Test and licensing rules that connect to the real world, actual potential accidents that could happen. And I am just really grateful that this kind of meeting is taking place, and from what someone tells me who has been to many of these meetings that this really is a good example of a good faith effort to have some honest dialogue and communication.

And it is also good to see the democratic process at work, and we try to use it to help the homeless in this community and going to many meetings like this, and some good can come out of it. And I have been to other countries where this kind of dialogue doesn't happen.

But I think when we can respectfully disagree, and try to understand our opponents, that some really good things can come, and a better world for us and for our future. Thank you.

FACILITATOR CAMERON: Thank you. Thank you very much, Brother. Yes, Lisa.

MS. GUE: Well, Chris, I guess I want to make this 3 for 3, and take exception once again to the conclusion listed on your presentation that no radiation was released as a result of this fire.

It turns out that this study was to examine specifically the effects of the Baltimore fire on the canister or on containment in the cask, and we can assume that had this study included this that the shielding would have failed probably completely as a result of those kinds of tests.

So even if this cask as a result of complete shielding failure were within the regulatory accident conditions, the actual radiation released from that cask after the fire would have been at a rate of one rem per hour from one meter, which is significantly more than zero.

I don't question the importance of studying the effects of fire on containment. That definitely is very important. What I do question is the presentation of a conclusion in such sweeping general terms without reference to the specific constraints of the parameters being studied, or the hypothesis being tested.

And the fact that this is being presented as a basis for the fire test proposal and the package performance study certainly gives us grave concern about the direction of the package performance study as well, and how the potential results of this study would be interpreted, and would be presented.

And I am saying that against the backdrop of our experience, where the NRC and Sandia have allowed video footage from old tests on how obsolete casks to be widely misused by the nuclear industry and the Department of Energy in promoting nuclear waste transportation schemes.

So I guess I don't want to have to be in the same position that I find myself in now in 2005 when these studies are completed, following you folks around the country to repeatedly type up that in fact the facts and conclusions that you are putting forward are only applicable to the more constrained hypothesis that was being tested.

If this study is to go forward in the limited framework that has been proposed, we need to known in the presentation of eventual conclusions clearly what the parameters were, and what the artificial constraints were on those studies, and how it does -- to what extent it does and to what extent it doesn't relate to an actual accident scenario.

FACILITATOR CAMERON: Okay. Thank you. It is similar in a sense to what Diane raised earlier about really explaining what we did not do, but explaining any of the constraints or not making this more applicable than it seems. Is that the point that you are trying to make or that you are making?

MS. GUE: Yes. My point is that the conclusion that is needed is not accurate.

FACILITATOR CAMERON: Okay. For the

record, the point is that the conclusion is misleading. All right. Yes, sir.

MR. TITUS: I am Robert Titus, a native Nevadian. My background is engineering and atmospheric science, with 30 years at the Nevada Test Site, and I am proud of it. I have one question and a comment.

The man from the Department of Transportation, how many tunnels are there on the rails that lead from where you have to move the waste to its repository?

MR. BOYLE: I have no idea how many tunnels there are in America.

MR. TITUS: I am not talking about America. I am talking about the railroad tracks that lead to --

MR. BOYLE: I have no idea. I couldn't tell you.

MR. TITUS: I would guess that there aren't very many,a nd my comment is that I have been sitting here all day listening to questions and statements that range from the expert through the inane, to the ridiculous.

I have heard Mr. Halstead and some of the others jousting at scenarios whose probabilities are probably a couple of orders of magnitude lower than getting hit by a meteorite.

Everybody here should realize that 99.99 percent of the nuclear waste is going to be moved from A to B in casks with no problems. And if you do have accidents, then there is a range of accidents.

So the probability of some of these ideas of an airplane hitting a truck in transport, or something like that, is completely out of the envelope. If that happens, it is one in a quadrillion sort of an accident.

And to try and base your design on things like that is utterly ridiculous. The costs are going to be prohibitive for what you gain, and that is my comment.

FACILITATOR CAMERON: Thank you, Mr. Titus.

MR. ZABARTE: I am not a statistic if I am involved.

MR. HALSTEAD: I don't have the exact numbers, Bob, but if you give me your mailing address, as I recall, DOE a very good study identifying the tunnel locations on the routes that could be used.

And the number is somewhere between 7 and 12 in Nevada. I don't know nationally. And a number of them are unfortunately in locations where you have steep grades and sharp curves in the area between Uvada and Muwapoa on the Union Pacific main line.

And to DOE's credit, they have identified them, but I don't know if they have factored them in to their risk analysis, but we would be happy to send you the information that we have on the tunnels.

FACILITATOR CAMERON: Okay. Let's go to Tom and Diane, and then we will go back out to the audience. Tom.

MR. DANNER: I just have a quick response here on the neutron shielding material relative to the fire accident condition. I know that was not part of the study. the analytical approach was to represent what was going on with the fire.

But the material performance of the neutron shielding material in the high storm was very similar to neutron shielding material that we use in our cask, which is NS4FR. It is the same material that was studied in the GA-4 and 9 casks that were mentioned here earlier.

And that material was studied under fire conditions in the early '90s, and presented at PEPTRAM in '92, I think. And the performance material under the fire condition was that only 6 percent of the mass of that material was lost during the fire.

The neutron shielding material on the cask is about 4 to 5 inches thick, and that means that over the condition or the life of this fire that you would have only lost maybe the outer inch of material. And the result is very, very little relative to the actual shielding impact.

MR. HALSTEAD: Can we get a clarification? Is that the regulatory fire, or Tom, was the fire run --

MR. DANNER: It was a regulatory fire.

MR. HALSTEAD: Right. I don't know to what extent our analysis of the Baltimore fire is the basis of people's comments on this, but the concern there is -- and first off there was also some confusion on the casks and whether we are talking about water jackets or these solid resin or polypropylene shields.

But I think that is possibly an issue of concern in the longer duration fires. I respect what you are saying about the regulatory fires.

FACILITATOR CAMERON: All right. Diane.

MS. NIELSON: Just to quickly pin down the specifics of the aircraft crash. In the private fuel storage hearings with the State of Utah, there was extensive testimony last summer, and the transcripts are publicly available, and now the decision of the

Atomic Safety and Licensing Board is available on the NRC website, some 220 pages of it.

In fact, the determination was that it is creditable, and that there is a creditable accident scenario for an F-16 crashing into the storage site in Skull Valley, but that storage site, in addition to including casks on a cement and soil pad, also include the canister transfer building, and the rail line or rail access and road access into the site.

The contention was that it was not a credible accident and that is one in a million. The finding of the Atomic Safety and Licensing Board was that it was at least four-fold, and so there is on record a decision by the Atomic Safety and Licensing Board that an F-16 crash into a facility that would include a rail and road transport is credible.

FACILITATOR CAMERON: Okay. Thank you, Diane. For those of you who don't know our website address, it is www.nrc.gov. And if you probably go to the Atomic Safety and Licensing Board, it should be fairly easy to find.

MS. NIELSON: The faster way is to go to deq.utah.gov. You will see a listing on the home page or down under the icon, for high nuclear waste storage opposition, and the documents available there in PDF, as well as the new releases.

FACILITATOR CAMERON: Great. Thank you. Thank you, Diane. Cash, did you have something that you wanted to say?

MR. JSASCZAK: I spent 30 years in the Air Force, and I flew the F-16, and I have been party to the conversation here and I am not going to take any exception to what my colleague next to me said.

But I would then ask you this question, and I do know this with some certainty, is that the Air Force in this case was extremely reluctant in any case to change any of its procedures, operating locations, or anything else associated with this in any manner that would have mitigated any of the kinds of things that would have changed the probability of those kinds of an accident.

There is competing national priority and there is all kinds of reasons for all various kinds of things happening, and I am not disagreeing with the fact. It is a probable act, but none of the things that would mitigate it or the willingness to give or find solutions appear to have occurred, and that is an opinion. I don't know anything more than that to be a fact.

FACILITATOR CAMERON: Go ahead, Diane.

MS. NIELSON: That is a fact. The NRC does not have the authority to require a change in flight plans. In this particular case the transport and storage is directly under the flight path of the Utah Test and Training Range.

That clearly is not the typical transfer route or transport route for spent nuclear fuel. But I would contend that if that facility is built it becomes the -- and if the Atomic Safety and Licensing Board decision does not stand, it becomes a very credible situation for us, and a very compromising one.

MR. JSASCZAK: I have no argument with that.

FACILITATOR CAMERON: And I would just emphasize the fact that the NRC is not going to try to change that situation for the reason that you gave. We don't have any jurisdiction to try and do that, and I guess I will just stop there.

MR. HALSTEAD: I just wanted to make the same comment, because it has been raised by Bob Titus earlier, and that is a similar situation with the situation with the flights on the Groom Lake side of the Nellis ranges, and Indian Springs.

We have never said, and in fact if I were writing the analysis for DOE, I would have said, man, you are really right. There is real potential for disaster here. We have got to come up with some administrative controls to deal with it.

And there are very straightforward things like scheduling of shipments, and location of the rail line versus flight paths. Now, none of those get you to a complete zero risk, but there are ways to manage those risks, and I think I am agreeing with Bob. Maybe Bob doesn't want to say, but I am certainly agreeing with the comments --

MR. TITUS: Well, I think it is credible, but not probable.

FACILITATOR CAMERON: We have to get you on the transcript and so you have to speak into the microphone. We are going to go back out to the audience and please introduce yourself.

MR. LEVENSON: I am Milt Levenson, and I am here as an observer from the Advisory Committee on Nuclear Waste. I have a simple question that I would like to have clarified in connection with the shielding issue. There is discussion about the neutron shield, and it may or may not partially disappear.

What fraction of the radiation coming from a spent cask is neutrons and what fraction is gamma? I know that a significant fraction is gamma, and so you don't lose all the shielding even if there is no neutron shielding, but what is the ratio?

FACILITATOR CAMERON: Tom. Do you have an answer to that?

MR. DANNER: I don't have one (inaudible-off microphone).

MR. HALSTEAD: I think it is 25 percent on the rail cask, but I can't remember the neutron, but I don't remember the number on the truck cask.

MR. DANNER: I can't tell you that ratio split right now. Most of it is gamma. That's true.

FACILITATOR CAMERON: We really need to get this on the transcript, okay? All right. Other comments or questions?

MS. TILGES: Chip, he said he was with the Advisory Board on Nuclear Waste. Whose advisory board?

FACILITATOR CAMERON: Oh, good point. Good point, Kalynda. For those of you who don't know, the NRC has a number of independent advisory boards that advise the staff and the commission on the actions that we are taking, and in fact the Advisory Board on Nuclear Waste is one of those boards, and why don't we have the other member from the ACNW introduce himself.

MR. KOBETZ: I am Tim Kobetz, and I am on the staff for the ACNW. Do you want me to explain what we do briefly? All right. We are set up by FACA, which if you don't know is the Federal Advisory Committee Act, but we provide information specifically to the Commission.

The advisory committee reports to the Commission and gives them an independent view of what the NRC is doing on different issues. Transportation is one of them, and the Advisory Committee on Nuclear Waste was set up specifically for Yucca Mountain issues and transportation issues, and that kind of thing.

So we do not necessarily work with the staff, the other NRC staff. We give independent views to the Commission on what they are doing, good or bad. We have already commented on PPS earlier providing comments on these kind of things, or actually Milt did. And Milt is the lead transportation person.

MS. TILGES: Thank you.

FACILITATOR CAMERON: And I think that there is a website for the ACNW where you could go to to see when they are going to have meetings, and what products there are.

MR. KOBETZ: Yes, there is. You just go right into the NRC website and you can track your way to the ACNW through the organization.

MR. LEVENSON: The ACNW has commented

officially, which means that the letter is public, on an original draft of the PPS, and in fact briefed the Commission in a public meeting, like some of our others, and I think that was one of those that went out live on the internet.

So if some of you feel that you are in a fish barrel here, you should be sitting in a meeting that is going out live on the internet.

FACILITATOR CAMERON: Thank you. Other questions or comments from the public? We will come back out again. Carlos.

MR. LOPEZ: Carlos Lopez from Sandia National Labs. I would like to invite everybody here and anybody that will most likely read the transcript, to think through the problems or the type of accidents that they want to postulate, and please give us feedback to the PPS protocols in the way that have been mentioned, and sending comments directly to the NRC website, or writing directly to us.

And with some rationale behind -- and the reason that I say this is because Bob Halstead mentioned before that NTSB is likely to go back to the investigation of the tunnel fire, and I just want to say that NTSB looks for the reasons of the accident, and not the consequences of the accident.

So it could be a little bit misleading just saying that because things are not clear, in terms of the fire environment, that the NTSB is going to look at the accident again.

They may not have a very good reason why the accident happened, instead of trying to correct the fire, which they won't do. And also he mentioned the high speed wind scenario, where you possibly burn hotter given a pool fire, and the problem there that I would say is that it is harder to engulf a large object and expose it to this higher temperature for long durations.

And I just throw that out just to say please comment back. We want to make this the best that we can. The analysis that is currently in the protocols is just an example or just preliminary analysis to give you an idea of the things that we can do, and we are looking at different things other than the regulatory positions, and certainly we can consider upset fires as well.

But keep in mind that when it comes to real live testing that it is very hard to achieve those postulated cases, and you can dream of many, many cases, but can you test that. Can you predict that with a code. I think it is important to keep that in mind. That is my point.

We want to do a test that is severe, but we also want to be able to model, and to model it, we need to understand the environment, and postulate it. It is only good practice to postulate the problem well enough so that it could be well analyzed.

And just as you mentioned before, with everybody knowing the conditions, and the knows, and they can do the analysis themselves, and hopefully at some point we can come up with an agreement, instead of different people making different assumptions, and of course we are going to come back with very different answers.

And I am all for the meeting that has been mentioned before on the tunnel fire, and getting very technical about it, because it is necessary to understand what you guys seen, or I shouldn't say that, but rather what people mean when they say that it could have been more severe than the regulatory fire.

And just one last point. I just want to say that an accident that appears to be worse than the regulatory environment is not necessarily worse than the regulatory environment. Appearances is something else. You need to talk about technically how much heat you are putting into the cask, and for the fire, how much energy you are putting into a cask for a drop test, or impact test.

That is part of the reason that we do drop tests, or we are suggesting a drop test without a rail car, or a truck, and to basically pose a harder environment for the cask, and trying to come up with an agreement with what people want to see. Thank you very much.

FACILITATOR CAMERON: Thank you, Carlos.

MR. HALSTEAD: If I can respond. First of all the NTSB's mandate. It is an independent board, and it investigates accidents and incidents, and it does make recommendations to regulatory authorities about how to prevent them from recurring. That said, that is mostly to DOT.

The specific issue with Dr. Berkey is that he prepared a somewhat scathing critique of the NIST report for us two weeks ago. I was looking forward to having him speak publicly at the meeting last week.

What the NTSB asked him to come back and work on were two things; the causes of the Baltimore fire, and also the tile failure on the Columbia Shuttle. He had previously been a member of the board investigating the Challenger.

Now, we told him right off that the

national interest seemed to us that it was more important for Dr. Berkey to go back to the NTSB than honor the contract with us that he was holding.

And we are now trying to work out a negotiated settlement with the NTSB that allows Dr. Berkey to advise us on advising you on the development of the fire test protocols, but having him not comment further on your Baltimore fire report, as that seems to have a clear conflict of interest with his responsibilities in advising the Board.

And he is a very distinguished fire scientist, and we were privileged to having him advising us, and under the circumstances, we decided that we would not lean on the contractor to work for us, because of the necessity of him doing other work.

I do hope that we will be able to have his expertise on the more important issue here, which is developing good fire test protocols.

FACILITATOR CAMERON: Okay. John, and then we are going to go to Andy to tee up the impact.

MR. HADDER: A couple of brief things. Obviously the controversy over the Baltimore tunnel fire and the modeling clearly underscores the need for a full scale physical testing of this concept.

I mean, certainly modeling as we all know as assumptions, and there is differences of opinion over what variables and how they should be used. So this underscores the need for getting real data to support the best way to do modeling in the future.

So I think that is one of the bottom lines. The other point that I wanted to make or the other thing that I had not heard yet, but in terms of a fire test I was wondering if the NRC had been considering looking at inhomogeneous fire as part of the cask itself.

The document handed out sort of showed images of an engulfing fire, and where the heat was distributed rather symmetrically in the cask, and I am concerned that that overlooks the possibility that an asymmetric heat could create stresses inside the case that might breach it under different conditions. So I just wanted to put that out there as another variable to consider.

FACILITATOR CAMERON: Thanks, John, and before we do the break, and I don't think I can repeat what or how you termed it, Andy, but we have one more comment. Cathy.

MS. CORPOUS: My name is Cathy Corpous, and I am with the Peace Foundation, and I work with Kalynda and several other groups in town. Essentially public safety is number one here, but I have not heard once about what this waste transportation is doing to the earth, the land, the air, the water.

Now, let me tell you that there is a lot of indigenous animals and plants disappearing due to this at the Nevada Test Site, and I am sure, and i am quite positive that if these casks are not testified properly that the transporting of them will have major detrimental effects on the environment. And I just thought I would say that and that's it. Thank you.

FACILITATOR CAMERON: All right. Thank you, Cathy. Then let's take a break and we will resume at 6:30.

(Whereupon, at 6:15 p.m., the meeting was recessed.)

E V E N I N G   S E S S I O N

(6:33 p.m.)

FACILITATOR CAMERON: Okay. A couple of announcements. One is that we are going to adjourn at 7:30, unless we get done earlier, and we probably won't. But we won't keep you here any longer than 7:30.

We want to accomplish two things. One is to keep some feedback on the impact part of the protocol, and I am going to ask Andy Murphy to tee that up.

And secondly, we just want to make sure that if anybody is here who wants to comment, and who wants to ask questions, we will go out to the audience before we close. Andy, go ahead.

DR. MURPHY: This is going to be a quick and short tee-up. I think that a lot of the things that we had wanted to discuss as far as the impact testing, we have touched on fairly significantly today.

So I am just going to read off those bullets up there and say that the staff has proposed the speed range that we are interested in testing the casks for impact is between 60 and 90 miles an hour as a range.

The range was developed looking at the Holtec cask, and that we have to obtain a velocity of about 60 miles an hour before we have fully engaged the impact limiters, the shock absorbers, the honey comb boxes.

Below that speed, basically we are just testing the impact limiters, and it is the casks that we want to test. The 90 miles an hour came from looking at the statistics, and again that 6672 thing.

The numbers there, when we look at a 90 mile an hour train accident into a hard surface, that occurs about once in 10 to the minus 8 or 9, and statistically a very infrequent accident. So we selected this range.

The staff took a look at this a little bit more carefully, and decided that we were going to propose a 75 mile an hour accident into an unyielding surface, which we indicated this morning basically has the effect of doubling the speed as far as the kinetic energy dissipation, as opposed to going to a yielding surface.

The type of impact test that we are going to do is a drop and our initial options were either a drop or mounting it on a rocket sled. We decided that the rocket sled had enough uncertainties associated with it that the drop, which depended upon gravity, which is sort of an unchanging quantity, would give us a better technical engineering test.

We decided -- and when I say decided, I am not saying that we made the decisions already, but we had to do something as far as our proposals. We had decided to propose, and that's what I mean, and I will slip into it all day and have done it all day, that for the orientation of the cask, our proposal was that the Holtec cask would be dropped in a center of gravity over corner, the lid corner, at an angle.

And as the figure that Ken showed you this morning would imply, and that the GA-4, the truck cask would be done in a back breaker orientation, which bypasses the impact limiters, in some sense similar to an accident that might occur if the cask came off the conveyance, and hit a bridge abutment, or a bridge pier; obviously a very strong bridge abutment or a bridge pier.

Those are the basic proposals, and I will turn it back to Ken, or turn it back to Chip to begin the dialogue up again.

FACILITATOR CAMERON: Thank you, Andy. Do we want to just ban Bob Halstead from speaking for the rest of the time? All right. Let's start with Mike.

And, Mike, at this stage of the game, you can start anywhere that you would like with this.

And let's try to get some reaction to what Mike suggested, and what Bob suggests, as well as your own comments. Mike.

MR. BAUGHMAN: I am looking at figures 41 and figures 46 in the document, and I guess these two figures illustrate the cask without the impact limiters on it, and it appears that those are not included on here.

So maybe there is a test like this with them on, but here is my point. I want to get back to this issue of realism, and we have talked about realism before, and it seems to me that specifically for the back breaker scenario of the test that a -- and I am a little concerned about when this comes off the truck.

And so let's assume that we have a back breaker test where the cask is actually attached to the trailer, but it hits the pillar in the same configuration as we are shown in figure 41.

Now you have got the weight of the trailer, and you have got the cask actually mounted into that trailer, and I don't know how all the physics work, but it seems to me that it is not as likely to bend in the way that it is showing here.

Because now you have to wrap the trailer around it as well, and I don't know this for sure. But it just strikes me as though that we ought to consider that these things don't always leave the truck.

And in fact in this case that the trailer does add to the potential impact of the cask, rather than detract from it. I don't see even how in the back breaker scenario, I don't see how the trailer necessarily has to act as a cushion if you will.

So I throw that out for consideration, and I am just looking for realism, and I hate to think that every time these things crash that it is going to fall off, because if it does, it is going to be a lot longer before it gets dealt with perhaps.

DR. MURPHY: That is a good point. We had not specifically looked at that. To drop back a little bit, the impact limiters are not shown on here as they appear on the outside of the truck, but the weight and the masses were taken into consideration. I believe that they are illustrated by the little yellow and the gray thing on the end.

But we will take that and look at that, and potentially what the conveyance would do to change the physics at this stage.

FACILITATOR CAMERON: Thank you. I didn't mean to cut you off. Are you done?

DR. MURPHY: Yes.

FACILITATOR CAMERON: All right. Let's go to John, and then we will go down this way, and then we will go to Kalynda.

MR. KESSLER: We have not taken very much of a look at it yet, but we look at it from the probability grounds, and I think from what I am going to say that a factor of three is not going to make much difference in terms of where we came at it.

We looked at the Appendix A stuff, and in there you would look at the statistics and say that a 60 mile an hour impact on essentially something that looks like an unyielding surface, with no speeds, et cetera, is like 10 to the minus 6 per year, with however many casks you think you are running, and that 90 was 10 to the minus 8.

I appreciate that that is an approximate, and you noted that is pretty low, and especially the 10 to the minus 8, and you said, well, you can compare that to Yucca Mountain, and transportation casks can run closer to population centers, and that is true.

I think that what we are concerned about is that you could do a lot more analysis to do a better apples to apples comparison here, and if you have other nuclear facilities that are located closer to population centers than Yucca Mountain, you could have looked at more than just comparing to Yucca Mountain. You could have looked at reactors, for example.

You could have looked at what the NRC allows for core damage frequencies, and then what that might lead to in terms of an early release fraction. I'm sorry for getting technical.

But the idea is that you need to look at where the container is, and what you allow for, for other risks of accidents, and look at what those relative releases are.

So you might want to compare relative releases and relative doses to come up with a better argument, at least in risk space, as to why 60 and 90 are reasonable.

When we took a quick look at it, we were convinced immediately that 90 was unreasonable, at least compared to when we look at both reactors and Yucca Mountain.

And the 60 is definitely borderline, and we think it is not just 60 miles an hour, but it is 60 miles into an unyielding surface. And when you add then on top of that probability of release and compare that to releases from other kinds of nuclear activities, we are still thinking that 60 miles an hour is way conservative.

FACILITATOR CAMERON: Okay. Thanks, John. And everybody feel free to comment on what they hear from the panel. Judy.

MS. TREICHEL: I would like to propose that you test with impact limiters and then without, because that gives you a way of testing the impact limiter, and what a good job it does.

But as I remember from some of the old films with the '77 Sandia test, when the thing hit the wall, it jumped out of its cradle and its impact limiters. It just sort of became a missile by itself.

And then it did its drop or hit, or whatever it did after it flew out. So it seems like it could be tested first with the impact limiter, and then without.

FACILITATOR CAMERON: Go ahead, Andy.

DR. MURPHY: I would like to make just a simple quick comment here. We have gotten maybe two conflicting ideas going on. The first is that we are talking about potentially doing test to failure, and we will have to figure out what that means.

But are you in this particular instance suggesting that we do an impact limiter test to failure, and then a non-impact limiter test to failure?

MS. TREICHEL: No, I think you should save the thing -- when you are doing it with the impact limiter on there, you are pretty much testing the impact limiter. And when you watch that truck run into the wall in the old Sandia test, you see the engine, and the cab, and everything is just sort of an accordion pleading on up through the impact limiter.

And by the time that the cask actually frees itself and takes off, a whole lot of that crash has been absorbed by other things. So you are really testing the other stuff, rather than the cask in that one.

DR. MURPHY: Okay. I will say that is potentially a different scenario than what we had been thinking about if you are talking about test to failure with or without an impact limiter. And now you have added the condition of adding the conveyance.

So if you are going to make the comment to us, we need to have the full details of the test that you are suggesting, okay?

MS. TREICHEL: Okay. Yes.

FACILITATOR CAMERON: All right. And we are going to go to Fred and Bob, and I would just ask everybody to keep in mind what John said about the --

at least in risk space, looking at the 60 and 90 miles per hour, that the 90 is really outside of its -- it is not risk informed.

(Discussion off microphone.)

DR. MURPHY: It does not seem precedented in terms of what the NRC has thought about before.

FACILITATOR CAMERON: Okay. And Fred, or Bob, or anybody else who wants to comment on that as well as your own comment? I want to try to give the staff a feel for how other people think about that. Fred.

MR. DILGER: First, let me just say that I think that the rocket sled idea can be discarded out of hand. I think we talked about that a lot, and that is a dangerous, risky, hard to control, way to test these things.

And I think that dropping it is probably the safest, and best, and smartest way to do that. In terms of the orientation of the cask, as I understand it, and please confirm this for me, but the center of gravity over the lid cover, that is the test proposed for the rail cask; is that correct?

DR. MURPHY: That is correct.

MR. DILGER: And then the back breaker is the truck cask.

DR. MURPHY: Yes.

MR. DILGER: Okay. The center of gravity over lid covers, first, these are both extremely tough tests. I think that testing these without impact limiters would be fine. In terms of the speed, Bob will make arguments for higher speeds, and I think that those are reasonable arguments.

However, the lower speeds are also fairly reasonable, and are reasonable, too, and I just am going to have to waffle on this and not give you any answer on the speeds tonight because I have to think about it some more and look a little bit more at some data before we go forward.

Second, in terms of the back breaker, I have said this before, but this is a very -- this is a really tough test that you have crafted here. If we were looking at realism, I would buy a highway abutment and put a highway abutment into your unyielding surface and drop the cask on a highway abutment to give you the most reasonable test.

I don't know of any highway abutments that are sheaved in steel, and I think that you would still have a very good and very credible test. And if there is a better way to do it with a steel sheave, I am certainly open to hear what that might be.

DR. MURPHY: The sheaving of highway abutments is going on routinely in California now for seismic conditions.

MR. DILGER: Well, that is a great answer.

FACILITATOR CAMERON: All right. Good. Bob.

MR. HALSTEAD: Well, on the drop test versus the rocket test, I think that there are a number of issues of drama that the rocket sled wins on, but in every other regard it seems to me that the drop test is better not only because of the results that it gives from on test, but frankly I can't imagine that it makes sense to build that facility and not use it for other drop tests.

And so not only does your learning curve improve if you do subsequent tests, but my goodness, you have got your facility prepared. I was intrigued by Felix Calard's (phonetic) observation with the difficulty of high drops missing the target, and I was not aware of that experience, and maybe you are.

So obviously that will have to be addressed through some testing of the test facility. But I think that there are ways, but we are strongly supportive of the drop test, and I suppose that someone could argue, and we would listen to the argument about the rocket sled, but I just have not heard anything that impresses me about it.

A couple of quick points. Regarding the back breaker test for the truck cask, while I stand by the things that I have said in the past pushing for that test, because it represents a severe loss of shielding event, and I think there are reasons that we would want to know about that, we are rethinking whether it wouldn't be better to do an end impact test on the truck cask from the standpoint of assessing a loss of containment.

And particularly because it is the combination of the impact on the lid, combined with the fire that a truck cask, because it is a smaller thermal mass required to heat the fuel inside that raises some real concerns for us about the combination of impact and fire that really gives you the kind of failure mode that we are most concerned about.

So having said, Rick, all those things that you so accurately critiqued last week about the elegance and the creativity of the back breaker test, it is possible that that isn't the test that we should do from the standpoint of trying to find the failure threshold.

Regarding the impact limiters, I know that you guys don't have a lot of time before next week's meeting, nor do we, but it would be really useful if you had already done this analysis or can do it. If you would give us some equivalency information on whether it is expressed in G-impacts, height, speed.

Tell us what the end drop tests might look like, the heights, if you did the tests without the impact limiters, and to put the same amount of strain on the cask that you do with the impact limiters, so that we can assess that in relation to our own desire to give you a counter-proposal, where we combine a regulatory drop test with a fire test, where first as Jim Channell said that we go to the regulatory duration of the fire, and then we run the fire out.

There is a real possibility that there is some economy in doing the test that way, but it would be helpful to us to see some numbers from you on how we would do the drop test without the impact limiters representing the same G-forces being there.

The impact of a severe or the implications of the impact test for installing the instrumentation that you would use in the fire test remains a great concern to us, and we would hope that you could come back and give us some ideas about frankly what your basis is for assuming that there are thermal couples and connections, or reports for them that would survive, particularly the 90 mile per hour test, and I think that might be relevant.

But I think the greater the impact that you put on the cask, the greater concerns we have about the instrumentation. Now, you may have a different strategy, but our strategy for the fire test was either to have the cask manufacturers install the thermal couples in the delivered casks.

Certainly they have the capability to do that at Sandia, and so it could be done right away. But that is an issue. And I guess we still need to think about the speeds and the impact orientations that we want to give you for test-to-failure.

But I will say that while that is an important issue that is a lower priority to us than, one, the regulatory tests of the full-scale test, and, two, the extra regulatory fire test.

And now if I had to choose between a regulatory impact test, followed by an extra regulatory fire test, or some combination of an extra regulatory impact test and a fire test, I think I would be inclined to try to go with the first combination. Anyway, that is our thinking at this point. Okay. Thank you, Bob. Kalynda.

MS. TILGES: It is going to be difficult for me to go into details, again not being a very technical person, but just to make it kind of slow and simple, as far as the appropriateness of the speed, I don't want to get into unyielding, and yielding, 75 or 90 miles an hour.

I simply want to say that we believe that the impact tests should be done at the highest possible speed that either the train or the truck could be traveling, and also the highest possible speed of a runaway train or a runaway truck. What those speeds are, I don't know. Hopefully I won't get the answer in wattage.

But as far as the reasonableness of this, as far as we are concerned, it doesn't matter to us if the likelihood is small. If there is any possibility at all for any of these things, it should be tested for.

And also as far as whether it should be dropped from a tower, or a roof of a building, or an impact test, frankly do them both. Do them all. Let me give you what I consider a real world situation that might help explain what I am talking about having lived many years in the Lake Tahoe area and still having family up there.

But let's just assume that we have a cask on a truck traveling over a high mountain pass, and unexpectedly the weather turns and the road becomes icy or wet, and slippery. The truck jackknifes, and got forbid, it falls over the mountain and hits a jagged granite rock, and then bounces off of that, and hits another one, and then another one.

And the truck bursts into flames, and it lays there for hours, and hours, and hours, before anybody, if anybody, can get to it. Those are the kinds of tests that I am talking about.

Those are the kinds of things that could really happen and have happened. So we are talking about -- these seem to me to be very simple, very logical things to do. And again Shundahai will be presenting or putting more details in writing. But I can't get down to speed. I am just talking about reality checks here on this.

FACILITATOR CAMERON: Okay. Thank you, Kalynda. Is my impression wrong that the staff has much less to do in terms of this impact test part of the protocol than they have to do on the fire tests? Bob?

MR. HALSTEAD: Well, it is hard for me to tell right now what I would like to ask them to do, but

I guess I would like to ask for a commitment, and I suppose we have to do this by next week to maybe get something that could be shared with people, and to look at their comments, as a lot of people will be working on their comments in April and May.

I guess I would like to see some additional modeling by the folks at Sandia of what types of deformation might occur. I guess one of the things is to take the impact limiters off and give us a range of impacts, and help us -- we have a much clearer idea of how we want to define failure thresholds with fire tests.

Again, as I have said, that is a lower priority to us than the impact test, but it would be helpful if you could provide some information. As far as the documents and the discussion of instrumentation, this is a very fine piece of work in the test protocols, in terms of the background issues need to be addressed.

And you are to be commended for that, as that is somewhat separate from I think how we feel about the specific scenario. But in terms of the ability to do the modeling, and the ability to explain what you are analyzing, and the discussion of background issues, in that regard I do think that they have or that they are further along.

And also in the fire area, there is a whole lot of discussion on the benchmarking of the cafe (phonetic) code with the large calorimeters that some of us are more familiar with that, though it not completely addressed in your document.

So there may be some other documents that maybe we should add to yours. But I would say that the impact testing is better developed. But it still would be helpful if you would help us define how we might model the failure thresholds for impact without fire.

I mean, what creates a pathway and what puts a loading on the spent fuel so that we -- I mean, is it possible to have burst rupture without fire? Well, probably not in an MPC, but in a truck cask, I am not so sure.

FACILITATOR CAMERON: Okay. Thanks, Bob. Mike.

MR. BAUGHMAN: Yes. Chip, you asked about the impact testing, and clearly one of the things that has to be done is to design and build a new drop test facility, and I would suggest or just offer as a suggestion that as you consider the design and construction of that drop test facility that you also consider that 100 percent of the shipments will travel through my friend's or my neighbors in Nye County to the Nevada Test Site.

And I think we would be remiss in not building that facility at the Nevada Test Site and not conducting all of the drop tests in the future at that facility, at the Nevada Test Site, which will allow those of us who are going to be living with 100 percent of the shipments the opportunity to view those tests on a more frequent basis, assuming that this facility gets used in the future.

FACILITATOR CAMERON: That is an interesting suggestion. Let me see if there is a comment from others around the table on that proposal. Cash.

MR. JSASCZAK: Nye County thoroughly endorses that proposal.

FACILITATOR CAMERON: All right.

MR. HALSTEAD: We think that this whole issue of how the testing facility should be chosen, and where they should be and all, certainly needs to be discussed somewhere. You know that there is interest in the Congressional delegation in this idea, and it is mentioned in their letters.

And so you need to figure out how to open that issue up for us to discuss it. You are talking about a big investment in a facility to do these drops.

FACILITATOR CAMERON: Okay. Thanks. Let's go to Peggy, Judy, and then back to Fred on this particular issue.

MS. JOHNSON: John had to leave, but I had my instructions before he left to ask this question. He wanted to know if the NRC was considering the slap down test.

FACILITATOR CAMERON: Okay. Let me just put slap down right up here in the parking lot. Is there anything else about the location of the test facility? Judy. Go ahead.

MS. TREICHEL: Well, I would never go on record as being opposed to having business come to Nye County or to Nevada, but I would suggest that since it was made very clear early this morning that this is not about Yucca Mountain, and this is about testing casks, and about the safe movement of spent nuclear fuel and high level wastes, if it needs to be moved at any time, any place.

That if you have a facility, and I am talking to the testers now, and not the Nye County sales people, that if you select a spot in Nye County, then it would be pretty much like the terrorist test facility that is now in Nye County at the Nevada Test

Site, where we are not being targeted for all of the terrorist activities. We are just having the training facility there.

So I just want to make it very clear that this is not about Yucca Mountain and that we were assured way long ago this morning that it was not.

FACILITATOR CAMERON: Okay. Thank you. Fred.

MR. DILGER: Speaking for Clark County, I just would like to say that one of the -- that I believe that one of the NRC's obligations to public safety are going to be exercised with regard to Yucca Mountain or to the private fuel storage facility, most over the coming 40 years.

And so I think that our discussions tonight directly do in fact directly relate to that. And we do endorse the idea that a testing facility like this could be profitably located in Nye County.

You know, one of the features and constant features of living in Clark County is the near mandatory trip out to Yucca Mountain to hear the dog and pony from the Department of Energy.

And in fact the testing facility out there, there are already a lot of testing facilities out there, and HAZMAT testing facilities, and a lot of others. It makes a lot of sense, and I had not thought about it before this evening, but it is an issue about how and where we test. But it does seem to make a lot of sense to me.

MR. HALSTEAD: And this is an important issue, both a Nevada issue and the larger issue of how the final protocols are done, and frankly it would be interesting to hear what your procurement needs are on all of this, and how will all of this be done, let alone how it will be budgeted.

FACILITATOR CAMERON: And we won't forget the slap down. Bob, you mentioned one other -- well, when you described an other issue of how Nevada was involved, in addition to this location of this test facility.

And I wanted to make sure that we weren't missing any discussion about how after the staff takes all of this material, and gets to a new point, is there a need -- the implication of everything that you say is that there is going to be a need for further -- almost continuing -- dialogue to work out what the best thing is to do. And I don't know if that is what you were referring to.

MR. HALSTEAD: Yes. And we certainly owe you a more formal proposal. We discussed it last week, but with the travel and everything, it has been hard to sit down at a keyboard and knock out any words.

In addition to calling to your attention the difficulties that we have had with stakeholder involvement, we have been thinking about some very specific ways that we could define the kind of stakeholder involvement over the course of the testing program that we think would be appropriate.

And some of it is as simple as costing out the number of meetings you have and the number of meetings. So of it is less straightforward, like how to do the peer review issue with Dr. Bonnie Graves (phonetic), both in terms of how you set up a good technical peer review with a true peer organization.

And also how you work into this process some ombudsperson type of representatives, because frankly it just frankly is not going to be realistic to have large numbers of people involved all the time in working out these details.

So Fred and I put some costs in our paper, and we have been beating each other up over costing these things out, and I was only half-joking when I said earlier that we are working from the assumption of excessive public participation in hostile peer review, and that is why some of our numbers may actually be higher than they end up being.

But I think we would like to give you as definite a proposal as we can, and we had hoped to be able to do it while you are doing the meetings so that other people could have access to our proposal and perhaps reject it, or propose it in their comments to you.

So we will have to work out some way if we can't do it by next week, and we probably can't do it through the website. And we also have some additional documents and things that we would like to have posted.

And I want to say a positive thing about the way that Sandia has operated that website. By and large, I think that is a big success, because there are some things that went on there, but we can't find the electronic files, or we can't find a decent enough copy of something to scan for you.

But by and large I think that has been one of the more successful parts of making this information available. I know that it discriminates against people who don't have internet access. So I guess they have to have some back up to provide paper copies on request, and I know that you guys probably do that all the time with your technical reports.

But that is where you have been real good, and I guess one of the things that we see as a combination of using internet communications and some formalized public process to ensure that there is the kind of interaction through the completion of testing.

FACILITATOR CAMERON: And you guys are going to put something together on that. Okay. That would be useful. Just let me make sure that there is no other process comments before we go to Peggy's slapdown issue. Diane, do you have something?

MS. NIELSON: This is a follow-up to Bob's comment, in terms of involving citizens in Utah in this, and we have talked about it a little bit during the breaks, but we also would like to see that sort of interaction, and sharing of information.

And once people realize that you are looking at the criteria for testing, and they have had an opportunity to provide information, again they are going to want to know what you used and what you didn't use, and why, and what the results of the tests were, and what does that mean in terms of transportation.

And how will that piece tie to the broader piece of transportation planning, and interaction with DOT, and rail transporters. So this is just the beginning of a lot of discussion, and the sharing of information, and that needs to happen in Utah all the way along that transportation corridor.

FACILITATOR CAMERON: Great. Thanks, Diane, and Kalynda has a comment on the location of the test facility, and then we are going to go to slapdown.

MS. TILGES: Okay. Kalynda Tilges. And let me say up front that that I am certainly concerned about business being brought into Nevada and making jobs for people, and making sure that we are involved in as much of this process as possible.

And I am not Western Shoshone, and I cannot speak for the Western Shoshone, but the Shundahai Network does stand up and fight for environmental justice, and indigenous rights.

And after saying that, I would be remiss in reminding everyone what John Wells said today, that the Nevada Test Site does not belong to the NRC or the DOE. It is Western Shoshone, and it belongs to them by the Ruby Valley Treaty of 1863.

And I don't believe that we can be discussing whether or not to put something there, but I believe with the four meetings planned are not nearly enough there need to be more meetings just in the very beginning phases, and all the way through, and I hope that these continue all along the transportation route.

And I will say again and echo Diane

Nielson's comments that these absolutely have to be held in Salt Lake City and Tuella (phonetic), and I would like to see more than one in each, and I would like to see the process continue to completion. Thank you.

FACILITATOR CAMERON: Thank you, Kalynda. Fred.

MR. DILGER: This is a process announcement, or a comment, and Rob Lewis mentioned to me that the paper, the counter-proposal that Bob and I have prepared is available, or that we did not bring enough copies for everyone, and it is available on the State of Nevada website.

I am not going to read the website address to you out of mercy and out of humanity's sake. But I will ask Chip to write it up on the process board.

FACILITATOR CAMERON: Okay. I am going to put this up and thank you, Fred. And how about the issue of slap down. Now, we heard a little bit about that in Rockville at the last meeting, I believe. Andy, can you just tell us a little bit about what is the slapdown issue test?

DR. MURPHY: To answer your question, we did very specifically talk about the slapdown as one of the potential orientations, and I can tell you that we decided not to include it in the proposal. Can I tell you at the exact reasons at the moment? I don't remember.

But as we go through the process at this stage, we will put it back on the menu as something to take a look at.

MS. JOHNSON: And I have to tell you that I didn't know that was the word for it, but when Kalynda was speaking about the full-scale testing as far as the speed of a runaway truck, or a runaway train, it was something that I had written down previously because I lived in the State of Washington, as opposed to what the terrain is here in the State of Nevada.

And we have very high mountains in the State of Washington, and I was going through (inaudible) Pass one evening, and a truck lost its brakes, and went over the side of the mountain, and I would think that would be that slap down test maybe, when it starts hitting, and I think that is a really important thing.

And I think that we are luckily not a flat country, and from what I understand, a lot of these proposed routes are across very steep hills. And I would imagine that you would not let somebody get out there on the road in a storm or in a proposed storm, but brakes do fail.

And I think that those are some of the things that we really need to take into consideration.

FACILITATOR CAMERON: Thank you very much, Peggy. Mike.

MR. BAUGHMAN: A quick question. Maybe I missed this earlier in the day, but I did note in here that we are talking about a 6 year test plan, and it says here that the casks in the PPS represent a 6 year work plan. That is on page one, in the introduction.

Is that from here forward? Can you give us a general sense of timing on this? When might the results be available?

FACILITATOR CAMERON: That is one of the issues that we have up here in the parking lot and so that's great. Can we get an answer to that?

MR. BAUGHMAN: Let me just note that my interest in the answer is 6 years from today is roughly 2009, which is getting very close to DOE's current schedule for the first shipments.

And if they do it for cooling purposes or whatever out there, that may be after the first shipment. So if this is going to inform in any way or cask testing or cask certification, it strikes me that

6 years may be too long. So I was just curious about that.

DR. MURPHY: Let me give you a little bit of a time line. We are finishing our public comments on the 1st of June, and we are going to take several months to analyze those and to begin to make recommendations and proposals to our management as to what to do about them.

I was talking to one of the reporters during the humanity break, and he was told the time line that we would be hoping to have some kind of a draft, and maybe just for internal consumption, by the end of this calendar year.

And depending upon exactly how things go forward, the important driving points at this stage are the acquisition of the casks, which will be acquired according to the Federal Procurement Regulations to answer Bob's question on that.

And in talking with the two cask vendors that we have used in the test protocol, Holtec indicated that their current scheduling would be approximately 18 months from the time an order arrived at their door to delivery.

General Atomic indicated about 2 years or 24 months. Now, we need to take all of these times with a little bit of salt, because they may be able to do procurements faster than they had indicated, and do construction or fabrication faster, or it may take longer because of special materials that they need.

But those are good working numbers, so that we are talking about having testing in '04 and '05, so that the 6 years is more from '99 into '05, rather than from 6 years from today until we have the test results available.

FACILITATOR CAMERON: Okay. Thank you, Andy. Diane.

MS. NIELSON: I guess at this point that I have to say that if the licensing board decision stands, that time frame may be just fine. If the licensing board decision does not stand, and Private Fuel Storage goes forward with their proposal in Skull Valley, at this point they are anticipating completion of construction sometime in 2004.

It is entirely conceivable, because the NRC isn't regulating or making a decision on transportation to Skull Valley, that all of the work that you are talking about right now, all of the testing, all of the planning, all of the preparation for the public, will in fact be occurring with used casks, because Private Fuel Storage will already independently, and without any authority from DOE, or the NRC, beyond what you have right now -- and certainly without the completion of the information on this testing protocol -- be shipping spent nuclear fuel across the United States on one of the transport routes that the EIS for Yucca Mountain decides in to Utah, and into Skull Valley. And that is an unacceptable scenario.

FACILITATOR CAMERON: Two points there. One is that that sort of reemphasizes your point from this morning that used casks -- well, perhaps not. We are not going to have this test done in time for --

MS. NIELSON: Well, I guess the kind of used cask is that you ought to uphold the decision by the licensing board, but the point of my comment is that this schedule, if it is going to be useful for us in the context of Skull Valley, has to be faster than that.

And for all of the reasons that you would do this if you were shipping to Yucca Mountain, you need to be doing it if you are shipping to Skull Valley, and if you are not prepared to do so, then you need to be prepared to put a halt to transportation to Skull Valley until this work is done.

Because the very same shipping routes, and the very same alternatives, with significantly less testing protection and management of the shipments, and everything else that goes along with that, will be absent.

FACILITATOR CAMERON: Bill, can I check in with the audience first, and then I would like you to close the meeting out for us, too, and so maybe you can -- well, do you want to make a quick point on that? Go ahead.

MR. BRACH: Let me make just a very quick comment. I mentioned early this morning when we first started, and I realize that has been a few hours ago now. But our planning for the package performance study is not tied specifically either to the consideration of Yucca Mountain as a national repository, or to the licensing of the Private Fuel Storage facility, or any other spent fuel storage facilities, or planned spent fuel transport.

And realizing that much of the discussion during the day has been with regard to the timing of the study, and the potential for Yucca Mountain if it were to become licensed to become or to start receiving fuel, and in those time frames involved, and the same for Private Fuel Storage.

But the study is not planned or envisioned or from our perspective a necessary element to support the licensing or potential licensing of either of those facilities or other storage facilities.

Now, a little more coincidental, in that the timing -- and, Andy, just to summarize, in the 2005 time frame, assuming that all stays on track and the scheduling and testing occurs in that time frame, it would be commensurate well before the scheduled time for the Yucca Mountain facility, if that were to become licensed, and also the PFS facility.

And, Diane, you had just summarized the time frames, and depending on the future outcomes of board decisions and actions, but I wanted to stress that this study and the conduct of the study is not tied to any of those licensing considerations.

I do recognize the points that you have made with regard to the purpose of our meeting today, and following meetings, is in outreach activities, and listening, and hopefully gaining understandings by a broad cross-section of stakeholders on what we are doing, and why we are doing it, and the information and results that we generate, how that would be used in our licensing and regulatory activities.

But it is not specifically tied to the PFS or to the Yucca Mountain licensing activities.

FACILITATOR CAMERON: Go ahead, Diane.

MS. NIELSON: Could I respond? I always hesitate to say that this is the most important message, but I guess based on what you just said that this is the most important message.

Interstate transportation of spent nuclear fuel to any temporary or permanent storage facility in the west that is going to travel through the State of Utah should not be conducted until after this testing protocol is completed, and the testing has been done, and the results of the testing have been included in the transportation requirements and cask requirements, and the other procedures that are dependent upon these cask testing protocols have been fully accomplished.

It goes beyond trust with citizens, and it is a safety issue. The reason that we are having this discussion is a safety issue. The reason that we are having it I think is because at some point soon based on current plans, we are going to be transporting all of the Nation's spent nuclear fuel on one of these two transportation scenarios, by rail or by truck.

And I think that this is absolutely critical information, and I think that the public expects it, and I am encouraged that we are having this discussion, but I can't imagine having it after transportation begins, and after you have already certified the casks.

MR. BRACH: I understand your comment, but as I mentioned before, from the NRC's perspective, and as I mentioned earlier in the discussion this morning, that we are confident with regard to existing regulations and practices currently in place for the transport of spent fuel, but I understand your comment and respect the views that you offer. Thank you.

FACILITATOR CAMERON: And I don't think it can be underemphasized based on what Diane is saying. Let me see if there is anybody in the audience that wants to ask a question or make a comment at this point. And we will come back up. Anybody?

MS. TILGES: Chip, I actually have something to present on behalf of the public if there is no questions from the public.

FACILITATOR CAMERON: Let me just check and see. Anybody? Okay. Before we do that, let's hear from Bob on this last issue.

MR. HALSTEAD: I want to briefly add to what Diane has said. Certainly Utah and Nevada would love to be relieved of the potential burden of receiving all of this spent fuel, and in the case of Nevada, high level nuclear waste.

And perhaps that will come to pass, but right now for your planning purposes, I don't think the kind of project that you are proposing would be proposed at this point in time, nor would it be supported I think by the people who have to support it and I am thinking of the people in Congress, if we weren't facing this.

And I am not sure how you thought through all the appropriations issues, but as I understand it, these are not insignificant costs and will probably be paid for from the Waste Fund. So in that way there is a link here.

And I am actually a little caught off-guard and speechless at the end of the night. I don't disagree or rather I may disagree, but I am a little caught off-guard by the way you phrased this, Bill, because my understanding was that the entire rationale for this program was the pending dramatic increase in the number of shipments, and that is what raised the public concern.

And while we have told you that we think that you should focus on public safety rather than public confidence, I think if you didn't feel that you were facing some crisis, or at least some opportunity to address that public confidence issue, you would be doing this.

So I preserve the right to bring this up again at the next meeting as a kind of closure thing at our Chicago meeting. But I think your points are very well taken, Diane, that in the event that you -- that in the event that the Skull Valley PFS license does go forward, and it is on a faster track than this program, I think that you need to think about that right now from the schedule standpoint.

Now, on the other hand, given DOE's schedule, you probably have some time.

FACILITATOR CAMERON: All right. Judy, and then we will go to Kalynda. Go ahead, Judy.

MS. TREICHEL: I think we are a little backwards here. I don't think that you need to hurry these tests. That has been the problem all along, is that everybody has got to jump in there and serve the nuke guys. I don't think so.

You have got a lot to put together, and if you do it well, it is going to have to be well planned out, and done in a good way, and the hell with these people.

This is crazy. The thing that is too soon is a potential Skull Valley temporary site, and a potential Yucca Mountain repository. They might have to wait until you can do it right, or they might have to wait altogether.

But you don't do this stuff until you are ready, and you don't get sped up. If your test isn't done, and somebody says they are ready to go, you are going to somehow or another muster the courage to say, well, no, I'm sorry, we really have important things to do and we can't guarantee to these people what they need to be guaranteed. So we are accommodating the wrong servant here.

FACILITATOR CAMERON: Okay. Well, that is a very useful discussion on that particular point. Kalynda, did you want to -- are you going to show us a movie at this stage of the game? I don't think we can do that.

MS. TILGES: It is just a short little film called "Duck and Cover." No, anyway, as I stated -- Kalynda Tilges. As I said earlier on that I was very concerned about the public participation in this, first of all, the invitation that the public would have a certain period for comment, and the agenda being changed without notice.

But before that, even seeing the notice, there were quite a few groups who were very concerned with the fact that this was supposed to be an open public workshop for the benefit of the public.

But was put together during the middle of the day and in the middle of a week day, and when most of the public is working or at school. So to me that is not a public workshop. That actually dissuades the public and it discourages public involvement and public empowerment.

So what we decided to do -- Public Citizen, Shundahai Network, and Nevada Nuclear Waste Task Force -- was to hold our own workshop. Bob Halstead was a presenter and we did a presentation, and we did a workshop specifically for the public last night.

And we took public comments, because not everyone could make it here today, and not very many people could make it here today at all. So I would like to submit for the record the videotape that we took of the entire proceedings, and all the public comments.

And along with that, I would also like to submit in their entirety my sheets on the WIPP experience and, "Too Little, Too Late," our talking points, and Shundahai will be submitting a more detailed, written comment later.

But at least you do have a little bit more public involvement here, and I am hoping -- and quite frankly, I am tired of doing your all's job. You have got quite a large staff at your disposal, and you have millions more dollars than a grass roots group can do, and if you can't do any better, then maybe you need to hire someone who is used to working with a little less money, and a lot more consideration of the public. So whoever would like to take these.

FACILITATOR CAMERON: Well, we appreciate the fact that you are providing that information for us, and thank you. And Diane, did you have something else, or did you have --

MS. NIELSON: No.

FACILITATOR CAMERON: All right. I guess I would just like to thank all of you. You were really a wonderful group, and thank you for your patience, and your comments, and fortitude, and with that, I am going to turn it over to Bill Brach for some final words, and then we will adjourn.

MR. BRACH: I will be very brief. I am sitting here looking at a clock that says 7:35 p.m. and that is local time, and I can speak for myself and a number of people at the table, and in the audience, that maybe their body is still on Eastern Time. So you can add 3 hours to that.

So it has been a long day, but I would like to go back to the opening comments that I had this morning as far as what did I see to be a measure of our goal if you will for the success of the meeting.

And what I tried to lay out this morning was a goal that I have, and which I think we all had for the meeting, was to have an open dialogue, respect for differing views, and I believe that we have had that on a number of topics, whether it be on the impact, the fire, overarching issues.

I think we have heard a wide spectrum of comments and suggestions to us and to the NRC for us to consider in the package performance study. That was the purpose of our being here, and I very much appreciate everyone's active participation and their comments.

As Chip mentioned this morning, the entire proceedings are being recorded, and I have taken a number of notes and I know that other staff here as well have for our consideration, and I thank you very much.

One comment and observation, and we can all pat ourselves on the back for this. Last week we had our first meeting in Rockville. We ended around 6:00 p.m., or somewhere thereabouts, and I had a similar seat looking towards the audience.

And I probably could count on one hand at that point in time around 6:00 p.m. the number of people that had stayed in the audience. I want to thank all the folks that have preserved, and it is 7:37 now, and so I told you that I would be brief, but I thank all of you for your perseverance and your active participation.

And as Andy has said, and Amy as well, we will be through the end of May, looking for and asking for your input and comments, and then over the following months doing our best to be sure we can understand and pull together from those comments and suggestions that we have received recommendations on how to proceed forward.

And Amy, too, has mentioned an important part, and it is on our part on how we are going to be providing feedback to you on following today's meeting and the other meetings, and the comment period.

The feedback to you as far as what we are doing, and the comments that we have heard, and how we understood those, and how we are proceeding, and for those comments -- and I believe Peggy specifically had asked this, for those comments not accepted, the kind of why not.

We need to walk through the process we are going to use to be sure we can provide that feedback and hopefully build the public trust that we have been talking about today.

So I want to again thank you very much. It is now 7:38 and I promised to be brief, and I thank you all very much. Thank you.

(Whereupon, the meeting was concluded at 7:38 p.m.)